d by Arya Samaj Foundation Chennai and e

The Indian
Medical
Gazette
Advertiser

64
(2)

Lib. G. K. V
Hardwar

Public Domain. Gurukul Kangri Collectio

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

078469

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

~~R-1245~~

028469

STOCK VERIFICATION
Central Library
2024-25 G.K.D.U., Hdr.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Fraser, F. C. 677
Fraser, J. C. 301

Galstaun, G. 717
Gama, A. D. 599
Gandhi, R. M. 659
Germuth, F. G. 491
Gharpure, P. V. .. 565, 673, 678
Ghosh, A. N. .. 387, 687
Ghosh, B. 558
Ghosh, D. N. 208
Ghosh, N. .. 205, 441
Ghosh, S. 61, 70
Ghosh, U. 182
Gill, C. A. 152
Gnanadikam, G. J. 194
Gore, S. N. 429
Green, R. 614
Green-Armytage, V. B. .. 261, 656
Greenway, L. A. N. 503
Greval, S. D. S. 673
Gubbay, R. 563
Guha, S. N. 414

Haldar, K. C. 382
Hance, J. B. 541
Hansraj, J. 510
Hari, D. L. 449
Havero Trading Co., Ltd. .. 357
Hawley, H. 378
Henderson, J. M. .. 386, 446
Henriques, J. F. .. 570, 571
Hepworth, S. M. 128
Hiranandany, K. M. 177
Husain, M. A. .. 85, 330
Husain, S. M. 692

Imam, S. B. 208
Irvine, G. M. .. 149, 307
Iyer, M. A. K. 571
Iyer, S. R. 77
Iyer, U. A. K. 207

Jamal-ud-din 150
Jolly, G. G. .. 319, 618, 624

Kamath, M. L. .. 26, 87
Karamchandani, P. V. 626
Karnik, C. H. 717
Kerr, Mrs. I. 247
Khan, B. M. 496
Khandekar, K. G. .. 256, 696
Krishnamurthy, Ch. 259, 299, 478, 679
Kulkarni, N. W. .. 196, 500, 684
Kutumbiah, P. .. 26, 87

Labernadie, V. 691
Labernadie, V. G. F. 495
Lahiri, K. P. 256
Lal, S. 479
Lall, P. A. S. 258
Lall, R. 9
Lalvani, P. P. 387
Landeman, E. 658
Latey, S. G. 673
Leitch, J. N. 658
Lloyd, R. B. .. 121, 361
Lowe, J. 24, 438

Mackey, G. 624
Mackie, F. P. 305
Mahadevia, C. G. 297
Mallannah, A. 199
Mallannah, S. 198
Mankad, M. B. 357
Maplestone, P. A. .. 371, 424, 610
Megaw, J. W. D. .. 354, 378
Menon, T. B. 659
Mitra, S. 316
Mitter, A. K. 208
Mody, N. C. 541
Mohanty, L. N. 694
Morison, J. 66
Mudaliyar, K. S. 695
Muir, E. .. 92, 386, 488, 620
Mukherjee, H. N. .. 118, 252
Mukherjee, N. K. 598
Mukherjee, R. K. 149
Mukherjee, U. P. 717
Mukherji, A. 443
Mukerji, A. K. 424
Mukherji, S. .. 718, 323
Mullick, M. N. 314
Murphy, R. A. 557
McGuire, C. 241
McGuire, G. 95
McRitchie, P. 328
McRobert, G. R. 225
McSwiney, S. A. 5

Nag, S. C. 90, 505, 683
Nanavatty, B. H. 632
Nande, D. 118
Nanhorya, H. B. D. 193
Napier, L. E. 314, 382, 446, 669
Nath, C. 257
Nigam, K. S. 355
Noronha, F. 21
Norrie, F. H. B. 328

Omar, M. A. 414

Pacheco, J. N. .. 356, 479, 561
Pai, M. K. 496
Pai, M. N. 89
Pal, M. S. 178
Pal Choudhury, B. K. 66
Paranjpe, A. S. 688
Parmanand, M. J. 190
Pereira, C. R. 260

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Pereira, J. M. 455
Pillai, K. V. 1
Pillai, M. D. 118
Poduval, A. R. 432
Pradhan, D. V. 692
Prasad, R. 298
Proctor, A. H. 4

Quiyum, M. A. 450

Rambo, V. C. .. 22, 145
Rao, G. R. 380
Rao, S. S. 76, 87, 130, 421, 601, 631
Ray, K. S. 211
Reinhold, C. H. 503
Roehl, W. 563
Rostock, P. 578
Row, R. 142
Roy, A. C. 382, 564
Roy, A. T. 417
Roy, J. D. 297, 298
Roy, M. B. 373

S. P. 716
Saha, A. 356, 498
Sarbadhikari, S. P. 478
Sarkar, H. 376, 619
Sarkar, K. P. .. 658, 718
Sen Gupta, J. M. 681
Sen Gupta, S. C. .. 25, 507
Seshachalam, T. .. 86, 509
Sharma, B. L. 571
Sharma, C. S. 478
Sharma, P. 330
Shoung, Ah. 618
Siddiqi, A. H. 385
Singh, B. 506
Singh, G. B. 659
Singh, R. 598

Sinha, D. N. 149
Sircar, P. B. .. 658, 718
Sircar, T. 598
Smith, H. S. 239
Speedy, W. D. .. 249, 629
Spittel, R. L. 192
Stephens, G. A. 178
Stocker, C. J. 297
Stott, H. 9, 258
Strickland, C. 386
Subbiah, M. 478
Sukhavanam, B. 261
Sur, S. N. 376, 558, 619

Thakkar, K. V. 198
Tomb, J. W. 246
Torpy, C. D. 511

Ubhaya, N. R. 550
Ujwal, S. D. 541
Umar, M. 255, 322

Vad, B. G. 684, 196, 500
Vareed, C. 73
Variava, D. H. 689
Varma, T. N. 356
Vasudevan, A. 125
Vatchaghandy, S. B. 572
Viswanathan, R. 328

Wade, F. O. 58
Wats, R. C. 79
Webb (Miss), M. V. 657
Webster, W. J. 197
Wilkinson, H. 598
Wright, R. E. .. 217, 549

Yusuf, M. 448

Zeganadin, A. 692

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CONTENTS

OF

VOL. LXIV

OF

"THE INDIAN MEDICAL GAZETTE"

ORIGINAL ARTICLES:—

Page

A Preliminary Note on the Action and Uses of Pseudo-ephedrine. By R. N. Chopra, M.A., M.D. (Cantab.), Lieutenant-Colonel, I.M.S., B. B. Dikshit, M.B., B.S., D.P.H., and K. Venkatachalam Pillai, L.M. & S. (Mad.) 1

The Continuous Administration of Saline per Rectum. By A. H. Proctor, M.D., M.S., F.R.C.S.E., Lieutenant-Colonel, I.M.S. 4

Cæsarean Section. Some Types and Their Uses. By S. A. McSwiney, B.A., M.B., B.ch., F.R.C.S.I., Major, I.M.S. 5

Seven Cases of Diaphysial Aclasis (Multiple Exostosis) in Indians, Including Four Cases from One Family. By H. Stott, M.D., M.R.C.P., D.P.H., Lieutenant-Colonel, I.M.S., and Raghunandan Lall, M.B., B.S. .. 9

A New Test for Albumin in Urine. By Chunilal Bose, C.I.E., I.S.O., M.B., F.C.S. 17

Report on the Investigation of an Outbreak of Epidemic Dropsy in Rangoon in the Year 1924. By K. R. Dalal, L.M. & S. (Bom.), D.T.M., D.P.H. (Liverpool) 19

Homogentisuria (Alkaptonuria) with Glycosuria. With Notes on a Detailed Clinical and Chemical Investigation of a Case. By J. P. Bose, M.B., F.C.S. (Lond.), and Sudhamoy Ghosh, D.SC., F.R.S.E. .. 61

The Spread of Dysentery in a Khasi Village and its Treatment with Bacteriophage. By B. K. Pal Choudhury, B.SC., M.B., and Lieutenant-Colonel J. Morison, I.M.S. 66

Berberine in the Treatment of Oriental Sore. By B. M. Das Gupta, and B. B. Dikshit, M.B., B.S., D.P.H. 67

Terminalia Arjuna: Its Chemistry, Pharmacology and Therapeutic Action. By Lieutenant-Colonel R. N. Chopra, M.A., M.D. (Cantab.), and Sudhamoy Ghosh, D.SC., F.R.S.E. 70

A Preliminary Note on the Action of Vasopressin and Oxytocin. By J. Christodoss David, M.B., B.S., and C. Vareed, M.B., B.S. 73

The History of Tick-Bites in Cases of Tick-Typhus in India. By S. Sundar Rao 76

Intravenous Calcium Therapy. By S. Rama Iyer, L.M. & S. (Mad.), V.H.A.S. 77

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

ORIGINAL ARTICLES—(*Continued*).

Some Sources of Vitamin C in India. By Captain R. C. Wats, M.D. (L'pool), D.P.H., D.T.M., I.M.S. 79
Blood Tests in Relation to Blood Transfusion. By R. B. Lloyd, M.A., M.B., B.Ch., Lieutenant-Colonel, I.M.S. 121
Gastric Syphilis. By E. W. C. Bradfield, C.I.E., M.S., F.R.C.S., Lieutenant-Colonel, I.M.S., and A. Vasudevan, M.B., B.S. 125
On the Determination of Age in Indians, from a Study of the Ossification of the Epiphyses of the Long Bones. By S. M. Hepworth, M.B., D.M.R.E., Major, I.M.S. 128
Radiology in the Diagnosis of Chronic Appendicitis. By J. H. Barrett, Captain, I.M.S. 129
Studies in the Treatment of Filariasis. By R. N. Chopra, M.A., M.D. (Cantab.), Lieutenant-Colonel, I.M.S., and S. Sundar Rao .. 130
Berberine Sulphate in Oriental Sore. By A. Lakshmi Devi, M.B., B.S. (Punjab) 139
On the Anopheline Mosquitoes of Hazaribagh (Bihar and Orissa). By Bhudeb Chandra Basu, M.SC. 141
The Fate of the Merozoites seen in the Cultures of Malarial Parasites. By R. Row, M.D. (Lond.), D.SC. (Lond.), O.B.E. 142
The Response of a Group of Indian Infants and Children to the Schick Test. A Preliminary Report of 186 Tests. By V. C. Rambo, M.D. .. 145
On a Recent Outbreak of Epidemic Dropsy in the District of Birbhum. By Kali Gati Banerjee, M.B. 181
Epidemic Dropsy in Birbhum. By U. Ghosh, M.B. (Cal.), D.P.H., D.T.M. (Bengal) 182
Indian Dietaries in the United Provinces. By Niant Dhan Banerjee .. 183
Detachment of the Retina. By M. D. Anklesaria, D.O.M.S. (Eng.), F.C.P.S. (Bom.), M.R.C.S. (Eng.), L.R.C.P. (Lond.) 186
A Note on *Spirillum minus* (Carter), the Causative Organism of Rat-bite Fever. By M. J. Parmanand, M.D. (Bom.) 190
An Improvised Drop Regulator. By R. L. Spittel, F.R.C.S. 192
Analysis of a Hundred Cases of Cataract Extraction at the Raipur Main Hospital by Smith's Method with a Flap of Conjunctiva. By H. B. D. Nanhorya, M.B., B.S. 193
Causes of Blindness. By G. Joseph Gnanadikam 194
A Modified Sippy's Line of Treatment in Duodenal Ulcer. By B. G. Vad, M.D., and N. W. Kulkarni, M.B., B.S. 196
A Note on the Anophelines Found in Baroda Camp. By W. J. Webster, M.C., Major, I.M.S. 197
Plasmoquin in Pregnancy. By K. V. Thakkar, L.M. & S. (Bom.) .. 198
A Vaccine for the Treatment of Phthisical Patients Who Expectorate Tubercle Bacilli in the Sputum. By S. Mallannah, M.D., D.P.H. .. 198
A Suggestion for Improvement in the Dietary of the Indian Community to Secure a Higher Degree of Health and Efficiency. By A. Mallannah, M.D., D.P.H. 199
Tattooing of the Cornea with Platinum Chloride Solution for Leucoma. By B. P. Banerji, F.R.C.S.I. 201
Breath Sucker Snakes. By Kidar Nath Dutt, L.S.M.F. 201
"Cooly Itch." A purulent folliculitis due to the Trichophyton violaceum variety Indicum. By Hugh W. Acton, Lieutenant-Colonel, I.M.S., and C. McGuire, D.T.M. 241
A Note on the Value of Medicinal Treatment in Cholera. By Dr. J. Walker Tomb, M.A., M.D., D.P.H., O.B.E. 246
Note on the Value of the Sedimentation Test in the Treatment of Leprosy. By Mrs. Isabel Kerr, M.B., ch.B. 247

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ORIGINAL ARTICLES—(*Continued*). *Page*

Notes for Staff Engaged on Anti-Malarial Work. By W. D. Speedy, M.B., B.ch. (T.C.D.) 249
A Note on the Anopheline Fauna of a Small Tank Throughout the Year. By E. S. Feegrade, I.M.D. 251
Experiments with Isotex as a Larvicide. By E. S. Feegrade, I.M.D. .. 252
A Simple Method for the Estimation of Blood Urea Applicable at the Bedside. By Harendra Nath Mukherjee, B.SC., M.B., D.I.C. (Lond.) .. 252
Results of Experiments with Crude Oil Products of the Burma Oil Co., Ltd., Rangoon. By E. S. Feegrade, I.M.D. 255
The Use of Pneumococcus Immunogen Combined in the Treatment of Pneumonia. By G. B. Bhaduri, M.B. 301
The Treatment of Vesico-Vaginal Fistula by Rectal Transplantation of the Ureters. By J. C. Fraser, Lieutenant-Colonel, I.M.S. 301
Malignant Anæmia of the Tropics. By F. P. Mackie, K.H.S., Brevet-Colonel, I.M.S. 305
A Review of Malaria during 1928 in a Minor Hill Station in the Punjab. By G. M. Irvine, Captain, I.M.S. 307
Observations on the Potency of Indian Digitalis. By R. N. Chopra, M.A., M.D. (Cantab.), Lieutenant-Colonel, I.M.S., and Premankur De, B.SC., M.B. (Cal.), M.R.C.P. (Edin.) 312
The Intensive Treatment of Kala-azar by Neostibosan; Part II. By L. Everard Napier, M.R.C.S., L.R.C.P. and M. N. Mullick, M.B. (Cal.) .. 314
Leprosy in Manipur State. By G. G. Crozier 315
On the Rationale of Treatment of Carcinoma of the Cervix Uteri. By Subodh Mitra, M.D. (Berlin), M.B. (Cal.), F.R.C.S. (Edin.) .. 316
A Year's Record of Kata-Thermometer Readings at Rangoon. By G. G. Jolly, C.I.E., Lieutenant-Colonel, I.M.S., and V. W. Fenn, L.M.F. (Bengal) 319
Kala-azar in Bijnor. By M. Umar, P.M.S. 322
The Carnivorous Habits of Indian "Blood-Worms." By S. Mukerji, M.SC. 323
Dangerous Blood Donors. By R. B. Lloyd, M.A., M.B., B.ch. (Camb.), Lieutenant-Colonel, I.M.S., and S. N. Chandra, M.B. 361
Encephalitis Lethargica—A Brief Description of the Disease, with Short Notes on the Post-Encephalitic Lethargic Cases Treated at the Ranchi Indian Mental Hospital. By J. E. Dhunjibhoy, Major, I.M.S. .. 362
The Species Distribution of Hookworms in India. By P. A. Maplestone, D.S.O., M.B., ch.B., D.T.M. 371
The Valuation of Charas. By D. N. Chatterji, B.A., B.SC., A.I.C., and M. B. Roy, B.SC. 373
Radiological Examination of the Liver in Cases of Suspected Amœbic Abscess. By J. H. Barrett, D.R.M.E., Captain, I.M.S. 375
Paris Green as an Anopheline Larvicide. By S. N. Sur, M.B., D.P.H. (Lond.), D.T.M. (Liverpool), and Haripada Sarkar, L.M.S., D.P.H. (Cal.) 376
Simple Tests for Stock Solutions of Quinine and Potassium Iodide. By J. W. D. Megaw, Colonel, I.M.S. and Herbert Hawley, M.SC., F.I.C. .. 378
Myiasis in Lepers. By G. R. Rao, D.M.C. (Madras), D.T.M. (Bengal) .. 380
A Preliminary Note on a Colour Reaction for "693" and its Application in the Estimation of that Compound in the Urine. By T. C. Boyd, F.R.C.S.I., D.P.H., F.I.C., Lieutenant-Colonel, I.M.S. and A. C. Roy, M.SC. .. 382
The Importance of Secondary Infections in the Causation of Filarial Lymphangitis. By H. W. Acton, Lieutenant-Colonel, I.M.S., and S. Sundar Rao, L.M.P. 421
Tetrachlorethylene in the Treatment of Hookworm Disease. By P. A. Maplestone, D.S.O., M.B., ch.B., D.T.M., and A. K. Mukerji, M.B. .. 424
The Use of Fibrolysin in Leprosy. By Norbert Figueredo, M.B., [illegible] .. 426
The Superimposed Blood Agar Slope. By S. N. Goré, L.M. & S. (Bom. Univ.) 429

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ORIGINAL ARTICLES—(*Continued*). Page

Avertin Rectal Narcosis. By A. R. Poduval, B.A., M.D., C.M. 432
An Analysis of 675 Cases of Puerperal Morbidity Treated in the Rotunda Hospital, Dublin. By P. C. Dutta, M.B. (Cal.), F.R.C.S. (Edin.), D.G.O., (Dub.), Lieutenant, I.M.S. 435
Leprous Reaction. By John Lowe, M.B., ch.B. 438
Perthe's Disease. By Nisanath Ghosh, M.B. 441
Isolation of the Antineuritic Vitamin. By Ashutosh Mukherji .. 443
Unusual Displacements of the Epiphysis of the Patella. By J. H. Barrett, D.M.R.E., Captain, I.M.S. 445
Kurchi Bismuthous Iodide, its Value in the Treatment of Chronic Amœbic Infections of the Bowel. By Hugh W. Acton, and R. N. Chopra .. 481
The Erythrocyte Sedimentation Test in Leprosy. By E. Muir .. 488
A Note on Cholera in Infants. By J. Das Gupta 489
The Effect of Tetronal on the Production of Hæmatoporphyrin in the Urine. By Frederick G. Germuth 491
Goitre in Multan District. By J. R. Chaudhuri 492
A List of the Species of Mosquitoes Collected in the French Settlements in India. By the late Dr. E. Borel and Major V. G. F. Labernadie .. 495
Records of Anophelines from the Bengal Dooars. By Bhupendra Mohan Khan 496
A Comparative Study of the Effect of Climate and of the Seasons on Body Weight in Pulmonary Tuberculosis in Different Countries. By M. Kesava Pai 496
The Treatment of Seasickness. By A. Saha 498
Observations on the Excretion of Alcohol in the Cerebro-Spinal Fluid and Urine after Oral Administration. By B. G. Vad, and N. W. Kulkarni 500
Local Anæsthesia by Apothesine in General Surgery. By A. B. Banerjee 501
Some Cases of Bacillus Coli Bacilluria. By C. H. Reinhold, F.R.C.S. (Edin.), Lieutenant-Colonel, I.M.S. and L. A. N. Greenway, M.R.C.S., L.R.C.P. 503
Notes on the New Conceptions of Sciatic Pain and on its Treatment. By J. B. Hance, O.B.E., M.A., M.D. (Cantab.), F.R.C.S.E., Major, I.M.S., N. C. Mody, M.B., B.S., and Shiva Datta Ujwal, L.M.P. (C. P.) .. 541
Webster's Operation for Entropion of the Upper Lid. By R. E. Wright, C.I.E., M.D., Lieutenant-Colonel, I.M.S. 549
Maternal Mortality in India: A Preliminary Study. By Captain N. R. Ubhaya, L.R.C.P. & S., D.P.H., and R. Adiseshan, B.S.SC., DIP HYG. (Camb.) 550
Microscopic Diagnosis of Malaria on a Group of Tea Estates. By R. A. Murphy, L.R.C.P. & S.I. 557
A Malaria Survey of Madarihat and its Environs. By S. N. Sur, M.B. (Cal.), D.P.H. (Lond.), D.T.M. (Liverpool), and Banamali Ghosh, M.B. (Cal.), D.P.H. (Cal.) 558
Pathological Laughing and Crying. By J. Norman Pacheco, M.R.C.S., L.R.C.P. 561
Chaulmoogra Oil in the Treatment of Trachoma. By R. Gubbay .. 563
Chemotherapeutic Investigations with Antimony Preparations in the Experimental Kala-azar of the Hamster. By the late Wilhelm Roehl, M.D. 563
A Coat Effect Observed in Mice when Fed with Fats under Certain Conditions. (A Preliminary Note). By T. C. Boyd, F.R.C.S.I., D.P.H., F.I.C., Lieutenant-Colonel, I.M.S., and A. C. Roy, M.SC. 564
Nervous Manifestations in Tuberculous Infections. By P. V. Gharpure, M.D. (Bom.) 565
X-Ray Work in Baluchistan. The New X-Ray and Electrotherapy Department of the C. M. S. Hospital, Quetta. By J. H. Barrett, D.M.R.E., Captain, I.M.S. 566

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ORIGINAL ARTICLES—(*Continued*).

Page

"Kataphylaxia," a Phenomenon seen Clinically in Filariasis. By H. W. Acton, Lieutenant-Colonel, I.M.S., and S. Sundar Rao, L.M.P. .. 601
A Case of Human Infection with a Gnathostome in India. By P. A. Maplestone, D.S.O., M.B., ch.B., D.T.M. 610
Notes on the Detection in the Urine of Some Drugs Used for the Treatment of Malaria. By Richard Green, M.B., B.S. 614
The Value of Preventive Inoculation against Cholera. By G. Jolly, C.I.E., Lieutenant-Colonel, I.M.S., J. J. G. Da Costa, L.M.S., and Ah. Shoung, M.M.F. 618
Epidemic Jaundice (Weil's Disease) or Malaria in Kandi Subdivision of Murshidabad District in 1928. By S. N. Sur, M.B., D.P.H., D.T.M., and Haripada Sarkar, L.M.S., D.P.H. 619
The Infectiousness of Leprosy. By E. Muir, M.D., F.R.C.S. (Edin.) .. 620
Observations on a Series of Bacteriological Examinations of Tube Well Water in Rangoon. By Military Assistant Surgeon G. Mackey, D.T.M., I.M.D., and G. G. Jolly, C.I.E., M.B., ch.B., D.P.H., D.T.M. & H., Lieutenant-Colonel, I.M.S. 624
Plasmochin Compositum in the Treatment of Malaria. By P. V. Karamchandani, Captain, I.M.S. 626
A Record of Malarial Cases in the Bengal-Nagpur Railway Construction Hospital, Titlagarh, from July 1928 to August 1929, with some Observations on Mosquito Findings and Conditions of Transmission. By W. D. Speedy, M.B., B.ch. (Dub. Univ.), and A. K. Adhikari, M.B. .. 629
The Significance of the Antimony Test in the Diagnosis of Kala-azar. By R. N. Chopra, M.A., M.D. (Cantab.), Lieutenant-Colonel, I.M.S., and N. N. De, M.B. (Cal.) 661
Notes on "The Significance of the Antimony Test in the Diagnosis of Kala-azar." By L. Everard Napier, M.R.C.S., L.R.C.P. 669
T. A. B. Vaccine in Relation to an Outbreak of Enteric Fevers. By M. K. Afridi, M.B., ch.B. (St. And.), D.T.M. & H. (Lond.), Captain, I.M.S. .. 670
A Simple Method of Standardizing the Red Cell Suspension in Connection with the Wassermann Reaction. By S. D. S. Greval, B.SC., M.D., D.P.H., Captain, I.M.S. 673
An Inquiry into the Physical Conditions of Indian Labour. By Dr. P. V. Gharpuré, M.D. (Bom.), and S. G. Latey, B.com. (Bom.) 673
A Further Note on the Treatment of Vesico-Vaginal Fistula by Rectal Transplantation of the Ureters. By F. C. Fraser, Lieutenant-Colonel, I.M.S. 677
A Note on Museum Making. By Dr. P. V. Gharpuré, M.D. (Bom.) .. 678
Dysentery in the Central Jail, Rajamandry, Madras Presidency. By Sub-Assistant Surgeon Ch. Krishnamurty, L.M.P. 679
Notes on Malaria in the Sibsagar District, Assam. By Assistant Surgeon J. M. Sen Gupta, M.B., D.T.M. (Bengal) 681
Notes on the Use of Carbon Tetrachloride. By S. C. Nag 683
Malaria Therapy in Tabes Dorsalis. By B. G. Vad, M.D., and N. W. Kulkarni, M.D. 684
The Indications for Suprapubic Cystotomy. By A. N. Ghose .. 687
A Note on the Action of Synthetic Adrenaline. By A. S. Paranjpe, M.B., ch.B. (Edin.), M.D. (Heidelberg), D.T.M. (Lond.) 688
Wertheim Schanta's Interposition Operation for Complete Prolapse of the Uterus. By Captain D. H. Variava 689
The Successful Use of a Tuberculous Methylic Antigen in External Tuberculosis. By Major V. Labernadie, M.D., M.S.P.E. (Paris), and Medical Officer Andre Zeganadin, M.S.M.H.T. (Paris) 691

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MIRROR OF HOSPITAL PRACTICE:—

Page

An Interesting Case. By T. S. Dakshinamurthi, L.M.S. 21
Post Encephalitic Parkinsonism. By F. Noronha, M.B., C.M., D.P.M. (Eng.) 21
A Case of Amyotrophic Lateral Sclerosis in an East Indian. By V. C. Rambo, M.D. 22
Nerve Abscess in Leprosy. By John Lowe, M.B., ch.B. 24
An Interesting Case of Melæna and Hæmatemesis in a Newly-born Baby. By S. C. Sen Gupta, L.M.F. 25
A Case of Acholuric Jaundice. By M. L. Kamath and P. Kutumbiah .. 26
A Case of Foreign Body in the Vagina. By Binode Krishna Banerji, M.B. 26
Two Cases of Surgical Interest. By Captain Mohd. Ajmal Husain, M.B., B.S., P.C.M.S. 85
Musculo-Spiral Nerve Paralysis Following an Intramuscular Injection of Quinine. By T. Seshachalam, M.R.C.S., L.R.C.P. 86
A Case of Hysteria (Narcolepsy?). By M. L. Kamath, B.A., M.D., and P. Kutumbiah, B.A., M.B., B.S. 87
An Undescended Testicle in an Unusual Position. By Francis Christian, M.R.C.S., L.R.C.P., L.M. 87
Occurrence of Chyluria after Confinement. By S. Sundar Rao .. 87
A Case of Syphilitic Basal Meningitis. By Lieutenant M. N. Pai, I.M.S. (T. C.) 89
A Case of Cephalic Tetanus. By Harendra Nath Bagchi, M.B. (Cal.) .. 89
Alastrim or Small-Pox? By S. C. Nag 90
A Case of Post-Kala-azar Dermal Leishmaniasis. By Nepal Chandra Dey 147
A Heart Case—for Diagnosis. By Provat Chandra Bagchi, L.M.F. .. 148
A Case of Bleeding from the Breast. By D. N. Sinha, M.B., and R. K. Mukherjee, S.A.S. 149
A Case of Unusually Large Cystic Goitre. By G. M. Irvine, Captain, I.M.S. 149
Congenital Deficiency of Two Fingers and their Metacarpal Bones. By Jamal-ud-din, Major, I.M.S. 150
An Interesting Case of Recurrent Pregnancy Toxæmia. By Sudhir Chandra Bose, B.SC., M.B. 202
An Unusual Complication of Kala-azar. By Nishanath Ghosh, M.B. .. 205
A Case of Ivory-Grafting. By S. C. Das Gupta, L.M.S. 205
Notes on a Case of *Bacillus coli* Septicæmia. By A Bayley De Castro, Lieutenant, I.M.D. 206
An Interesting Early Right-Sided Goitre. By A. Bayley De Castro, Lieutenant, I.M.D. 207
Apyrexial Pneumonia. By U. A. Krishna Iyer 207
An Interesting Case of "Chorea." By S. B. Imam 208
A Case of Inguinal Hernia with a Fæcal Tumour in the Scrotum. By D. N. Ghose, M.B., B.S., and A. K. Mitter, M.B., B.S. 208
A Case of Exfoliative Dermatitis after Neosalvarsan Injections. By Indulal S. Dave, M.B., B.S. 209
A Case of a Rubber Catheter inside the Bladder. By A. K. Dutt Gupta, M.B., D.T.M. 210
A Case of Medico-Legal Interest. By M. Umar 255
A Case of Valvulus of the Large Intestine at the Splenic Flexure. By T. S. Dakshinamurthi, L.M.P. 256
Tiger Bites and their Treatment. By K. G. Khandekar, M.B., B.S. .. 256
A Further Note on the Action of Hæmoplastin. By Kamakhya Prosad Lahiri, L.M.S. 256
A Large Ovarian Cyst. By Assistant Surgeon Rai Sahib Dr. Chhagan Nath 257

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MIRROR OF HOSPITAL PRACTICE—(*Continued*). Page

A Further Case of Diaphysial Aclasis (Multiple Exostosis) with a Marked Family History. By H. Stott, M.D., M.R.C.P., D.P.H., Lieutenant-Colonel, I.M.S., and P. A. Shunandan Lall, M.B., B.S. .. 258
A Case of Typhoid Fever, Relapse, Toxæmic Collapse and Recovery. By Ch. Krishnamurthy, L.M.P. 259
A Case of Hyperpyrexia for Diagnosis. By C. R. Pereira, M.B., B.S., and J. M. D'Cruz, M.B., B.S. 260
Roundworm Infection Simulating Appendicitis. By B. Sukhavanam, L.M.P. 261
A Case of Suppression of Urine. By B. Sukhavanam, L.M.P. .. 261
A Case of Acute Ascending (Landry's?) Paralysis. By R. Viswanathan, B.A., M.B., B.S. 328
A Case of "Glandular Fever." By F. H. B. Norrie, M.D., ch.M., F.R.C.S. (Edin.) 328
A Benign Spinal Tumour. By P. McRitchie, M.C., M.D., M.R.C.S., L.R.C.P. .. 328
Quinine Abscesses. By Captain Mohd. Ajmal Husain, M.B., B.S., P.C.M.S. 330
A Case of Pseudo-Pregnancy. By P. Sharma, M.B., B.S. 330
A Case of Induced Poly-Leucocythæmia. By L. Everard Napier, M.R.C.S. L.R.C.P., and K. C. Haldar, L.M.P. 382
A Case of Free Bile in the Peritoneal Cavity. By A. Hameed Siddiqi, B.SC., M.B., B.S. 385
A Case of Ectopic Gestation. By Aghore Nath Ghose 385
A Case of Myiasis of a Carious Tooth. By C. Strickland, M.A., M.D. .. 386
An Obscure Neurological Case Simulating Early Leprosy. By E. Muir, M.D., F.R.C.S. (Edin.), and John M. Henderson, M.B., ch.B. (Glas.) .. 386
Acute Amœbic Dysentery Treated by *Hedyotes Auriculares*, N. O. Rubiaceæ. By Captain P. R. Bhandarkar, L.M. & S. 387
Electro-Coagulation (Surgical Diathermy) in Multiple Angiomata of the Head. By P. P. Lalvani, L.C.P.S. (Bom.) 387
Three Cases of Combined Leprosy and Dermal Leishmaniasis. By L. E. Napier, M.R.C.S. (Lond.), L.R.C.P. (Eng.), and J. M. Henderson, M.B., ch.B. (Glas.) 446
Tabes Dorsalis in an Indian. By Mohammad Yusuf 448
Unusual Intra-Uterine Tumours. By D. L. Hari, M.B., B.S. (Bom.) .. 449
A Distended Bladder Simulating a Full-Term Uterus. By Captain C. C. Das Gupta, M.B. 450
A Case of Elephantiasis Cured by Arrhenol. By Md. Abdul Quiyum, L.M.P. 450
Retention of Urine in Blackwater Fever. By S. C. Nag 505
A Case of Accidental Poisoning with Barium Sulphide. By Bhupal Singh 506
Cerebral Symptoms Caused by *Plasmodium vivax*. By C. R. Das Gupta 507
Temporary Insanity Following an Attack of Malaria. By S. C. Sen Gupta 507
A Case of Staphylococcal Septicæmia. By Harendra Nath Bagchi .. 508
A Case for Diagnosis. By Prafulla Kumar Bachaspati 508
Notes on a Case of Human Hermaphrodite. By M. C. Albuquerque and T. Seshachalam 509
A Case of Abscess of the Iris. By Jadavji Hansraj 510
A Case of Diverticulum of the Œsophagus. By C. D. Torpy 511
A Case of Variola Treated by Vaccination. By C. D. Chatterji, B.SC., M.B., B.S. 569
A Case of Abscess of the Brain. By Suresh Chandra Das Gupta, L.M.S. 569
A Case of Accidental Suffocation in a Well. By J. F. Henriques, L.M. & S., F.C.P.S., B.M.S. 570
A Case of Rat-bite Fever. By M. A. Krishna Iyer 571
Ascariasis Simulating Abdominal Tumours. By J. F. Henriques, L.M. & S., F.C.P.S., B.M.S. 571

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MIRROR OF HOSPITAL PRACTICE—(*Continued*). *Page*

A Radical Cure for Hydrocele by Quinine Injection. By B. L. Sharma, L.M.P. 571
A Persian Treatment for Oriental Sore. By Sorab Bappji Vatchaghandy, L.M. & S 572
A Case of Filarial Abscess. By H. W. Acton, Lieutenant-Colonel, I.M.S., and S. Sundar Rao, L.M.P. 631
A Chronic Encysted Mammary Abscess Simulating Scirrhous Cancer. By Colonel B. H. Nanavatty, C.I.E., F.R.C.S., F.C.P.S., etc. 632
A Case of Irreducible Hernia Relieved by Atropine Sulphate. By D. V. Pradhan, M.B., B.S. 692
A Case of Urticaria. By S. M. Husain, B.SC., M.B., B.S. 692
A Case of Raynaud's Disease. By A. P. Bajpayee, M.B., B.S. .. 692
Two Cases of Leprosy Successfully Treated. By L. N. Mohanty .. 694
A Case of Enteric in Which the Widal Reaction became Positive on the 49th Day. By Rabindranath Chatterjee, M.B. 695
A Case of Aphasia During Spinal Anæsthesia. By K. S. Appu Mudaliyar Avl, M.B., B.S. 695
Naga Sores in Gwalior. By K. G. Khandekar, M.B., B.S. 696

EDITORIALS:—

A Medical Council in India 27
The Problem of Population 91
The Illness of H. M. the King-Emperor 151
Notification of Dangerous Diseases 211
Chemotherapy 213
Recent Researches on the Filtrable Viruses 267
The Life-History of *Entamoeba histolytica* 331
The Need for a Therapeutic Substances' Act for India 389
Exercise in the Tropics 451
The Parasitology of Malaria: An Appeal for Information 452
Preventable Blindness in India 513
The Parasitology of Indian Malaria. Unpublished Information .. 573
Research in Filariasis 633
A New Suggestion in Malaria Control 697

SPECIAL ARTICLES:—

The Campaign Against Leprosy. (Muir) 92
Hints on the Village Nurse Scheme. (McGuire) 95
The Present Position of Medical Science in India. (Gill) 152
Ophthalmology in Relation to Research. (Wright) 217
William Harvey's Message to India. (McRobert) 225
Some Reflections on Obstetrics and Gynæcology During 1928. (Green-Armytage) 261
Proceedings of a Conference held at Birnagar (Bengal), the 24th February, 1929, to discuss the Problem of Malaria Control at Birnagar. (Bose) 323
The Spleen. (Bhatia) 453
A District's Scheme for Cholera Control. (Pereira) 455
The Vital Capacity of the Lungs. (Bhatia) 519
The Importance of Refractometry in Clinical Research. (Rostock) .. 578

MEDICAL NEWS:—

The Indian Science Congress, 1930 214
The Far Eastern Association of Tropical Medicine 214
The Indian Honours List, 1st March, 1929 215

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MEDICAL NEWS—(*Continued*). *Page*

Fourth Imperial Social Hygiene Congress, 1929 215
Cambridge University Diploma in Medical Radiology and Electrology .. 215
All-India Medical Congress, 1928-29 217
London School of Hygiene and Tropical Medicine (Examination Result) 273
Bombay Medical Council 335
The American Medical Association of Vienna 336
The Sixth Postgraduate Course in Ophthalmology, Vienna, 1929 .. 336
The Nordoff Jung Cancer Prize 336
The Himalayan Journal 336
The British Journal of Urology 337
The British Empire Cancer Campaign. The Garton Prize and Medal .. 392
The Third International Congress of the World League for Sexual Reform 393
All-India Ophthalmological Society 393
The Journal of Nutrition 453
International Medical Postgraduate Courses in Berlin 453
Leprosy in India 516
The October 1928 Session of the Office International D'Hygiene Publique 516
The Indian Science Congress, 1930 517
The Extension of the Bai Yamunabai L. Nair Hospital, Bombay .. 518
London School of Hygiene and Tropical Medicine (Examination Result) .. 577
The Eighth International Congress of Dermatology and Syphilology .. 578
The London School of Hygiene and Tropical Medicine 636
The Industrial Anti-Malarial Advisory Committee of the Ross Institute .. 638
The British Social Hygiene Council 639
Bengal Council of Medical Registration 640
The Royal Institute of Public Health, London 640
Regulations for Diploma in Public 640

NOTES ON CURRENT TOPICS:—

Nasal Obstruction 29
Bromsulphalein Test of Liver Function 30
A Note on Blood Changes Associated with Liver Diet, etc. 30
The Problem of Mount Everest 31
Observations on Ultra-violet Ray Therapy 31
Migration of Hookworm Larvæ from Cultures 34
The Treatment of Early Rodent Ulcer 35
Culture and Differential Diagnosis of the Various Leishmanias on Solid Culture-Medium 35
Studies on Malaria, with Special Reference to Treatment. Part IX. Plasmoquine in the Treatment of Malaria 37
Gymnema sylvestre in Diabetes Mellitus 39
The Report on Sanocrysin Investigation 39
The Interpretation of Reports on the Cerebro-Spinal Fluid 40
X-Ray Diagnosis 41
The League of Nations and Opium 42
Low Back Pain 42
Quinine Troposan in the Treatment of Chronic Benign Tertian Malaria .. 99
The Treatment of Chronic Benign Tertian Malaria with Smalarina Cremonese 100
Urea-Stibamine: Its Preparation and Composition 101
Impressions of the Nature of Pernicious Anæmia in the Light of the Newer Knowledge 102
The Modern Treatment of Varicose Veins 104
A Fallacy in the "Heat and Acetic Acid Test" for Albumin in Urine .. 105
Uncommon Ill Effects of Salvarsan Treatment 105

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

NOTES ON CURRENT TOPICS—(*Continued*). Page

Observations on Chronic Splenomegaly in Childhood; Diagnosis and Treatment 155
The Therapeutic Value of Valerian 158
A New Test for Pregnancy 158
Treatment of Asthma in Children with Tuberculin 159
The Idea and the Method in Medical Research 160
Dental Disease and Dietetic Deficiency 160
Fracture Treatment To-day 162
Proposals for Next Steps in Preventive Medicine and Public Health .. 163
Tbc—Protective Vaccine with Dead Tubercle Bacilli 228
The Medical and Surgical Dossier or Patient's Case Sheet 228
The Origin of Civilization 229
Treatment of Ascites by Novasurol and Ammonium Chloride .. 229
Irradiated Ergosterol as a Wound Dressing 229
Albuminuria and Glycosuria 229
Silver Nitrate in the Eye of the Newborn 231
The Prevention and Treatment of Tuberculosis by an Immunizing Vaccine 231
Dengue Fever 274
Renal Therapeutics 275
Intravenous Quinine 275
Plasmochin in Malaria 275
Eight Years' Experience of Yatren in the Treatment of Amœbic and Bacillary Dysenteries and their Sequelæ 276
The Use of Crude Oil as the Larvicide of Preference on the Isthmus .. 277
Studies in Malaria, with Special Reference to Treatment 278
Swimming Baths 279
Ophthalmological Notes 280
Professional Etiquette 280
Influenza 281
Emil Von Behring 281
Medical Policy in India 337
Some Aspects of Dental Sepsis, Focal and Residual 338
The Treatment of Burns and Scalds by Tannic Acid 341
The Value of Modern Tests in Renal Disease 342
Testicular Pain 343
Some Aspects of the Surgery of the Spleen 394
Iodised Tincture of Guaiacol in the Treatment of Synovial and Serous Affections 395
Combined Drug Therapy in Some Problems of Cardio-Vascular and Renal Disease 396
Practical Notes 396
Fractures of the Ankles 396
Pyorrhœa Alveolaris 397
Remarks on the Treatment of Empyema 397
Sleep in the Treatment of Acute Disease 398
Therapeutic Notes 399
New Remedial Agents. Salyrgan: A Mercuric Diuretic 399
The Acnes 400
Ophthalmological Notes 401
The Morbid Anatomy of Sprue 401
Some Ophthalmic Emergencies in General Practice 457
The Methods of Investigating a Urological Case 458
Notes on Some Hæmatological and Serological Investigations in Leprosy 462
The Microscopical Changes Occurring in Organs after Death .. 463
A Simple Method of Preserving Fæces Containing Hookworm Eggs .. 464

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

NOTES ON CURRENT TOPICS—(*Continued*). *Page*

Value of Leucocyte Counts, According to Schilling Formula, in Clinical Medicine 464
Acetylcholine as a Depressant 465
A Study of the Use of Parathormone in the Control of Menstrual Bleeding 466
Acetylsalicylic Acid and Alkaline Citrates 466
The Intranasal Application of Insulin 467
Treatment of Neurasthenia 467
Medical Research in 1928 467
Electrocution from Electrical Apparatus 467
Some Modern Aspects of Nephritis 521
The Treatment of Pulmonary Tuberculosis 524
The Treatment of "Crescent Carriers" with Plasmoquine Compound .. 527
The Treatment of Quartan Malaria with Plasmoquine 527
Colles's Fracture: An Efficient and Economical Method of Splinting .. 528
Sedatives in Labour, particularly "Twilight Sleep" 590
Ovarian Therapy 592
The Treatment of Blackwater Fever by Oral Sodium Bicarbonate .. 592
Notes on Fractured Patella 641
The Medical Management of a Case of Gastric or Duodenal Ulceration .. 643
Pernicious Anæmia: Preliminary Note on the After-results of Treatment with Liver 645
Treatment of Pruritus Ani and Anal Fissure; the Use of Anæsthetic Solutions in Oil 645
The Treatment of Pernicious Anæmia by Liver 647
Difficult Labour 647
Barium Chloride in Typhoid Fever 698
Remarks on the Gall-Bladder in Relation to Focal Infection 698
Facial Neuralgias 699
Modern Surgery in the Treatment of Empyema 701
Investigation of Pulmonary Conditions with Lipiodol 702

REVIEWS OF BOOKS:—

Handbook of Diseases of the Ear for Students and Practitioners. By R. Lake 42
The Art of Anæsthesia. By P. J. Flagg 42
The Causes of Ante-Natal, Natal and Neo-Natal Mortality of Infants. By A. L. Mudaliar 43
Mongolism: A Study of the Physical and Mental Characteristics of Mongolian Imbeciles. By K. Brousseau 43
Methods and Uses of Hypnosis and Self-Hypnosis. By B. Hollander .. 43
Handbook of Sanitary Law. By B. Burnett Ham 43
A Shorter Anatomy. By E. Wolf 44
Mosquitoes in Relation to Disease.—Instructions for Field Sanitary Officers. By M. O. T. Iyengar 44
Lyon's Medical Jurisprudence for India with Illustrative Cases. By L. A. Waddell 44
Addresses on Surgical Subjects. By Sir Berkeley Moynihan .. 45
Local Anæsthesia. By G. de Takats 45
Scientific Reports from the Government Institute for Infectious Diseases, Tokyo, Vol. VI, 1927 45
Cancer, the Surgeon and the Researcher. By J. Ellis Barker .. 46
Medicine: Volume VII, No. I and No. II. Published by Williams and Wilkins Co. 46
A Pocket Medical Dictionary. By G. M. Gould 46

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

REVIEWS OF BOOKS—(*Continued*). Page

Filterable Viruses. By Various Authors 46
Elementary Pathological Histology. By W. G. Barnard 47
An Introduction to Experimental Pharmacology. By T. Sollmann and P. J. Hanzlik 47
Radiation in Chemistry. By R. A. Morton 48
Aphrodisiac Remedies. By the Staff of the *Practical Medicine* .. 48
The Endocrines in General Medicine. By W. Langdon Brown .. 48
The Extra Pharmacopœia of Martindale and Westcott. By W. Harrison Martindale. Vol. I 48
Gesundheits-Ratgeber fur Waermere Zonen. By H. Ziemann .. 48
Favourite Prescriptions. By E. Ward 49
The Essentials of Medical Diagnosis. By T. Horder 49
Clinical Medicine. By O. W. Bethea 49
Diabetic Manual for Patients. By H. J. John 49
Care of Infants in India: A Work for Mothers and Nurses in India. Published by Messrs. Caldwell 49
International Clinics. (A Quarterly Journal). Edited by H. W. Cattell 49
Recent Advances in Chemistry in Relation to Medical Practice. By W. McKim Marriot 50
Tropical Gynæcology (Clinical lectures). By V. B. Green-Armytage .. 50
Handbook of Physiology. By W. D. Halliburton 107
De Lamar Lectures 1926-1927. By Several Authors 107
Erythema Nodosum. By J. O. Symes 107
Aids to Psychiatry. By W. S. Dawson 108
Gynæcology. By W. P. Graves 108
Kala-azar Chikitsa (in Bengali). By A. K. Mukherji 109
The Treatment of Diabetes Mellitus. By Elliott P. Joslin 109
Urinary Analysis and Diagnosis by Microscopical and Chemical Examination. By L. Heitzmann 109
The Pathology, Diagnosis and Treatment of Neoplasms Originating in the Walls of the Urinary Bladder 109
Diseases of the Blood. By A. Pinney 109
Dental Medicine. By F. W. Broderick 110
Manual of Hygiene and Public Health. By J. L. Das 110
Two Essays on Analytical Psychology. By C. G. Jung 110
Rontgenology. By A. Kohler 111
The Practice of Refraction. By W. S. Duke-Elder 111
Blood Pressure: Its Clinical Applications. By G. W. Norris and others .. 164
Pathological Physiology of Internal Diseases. Functional Pathology. By A. W. Hewlett 165
Laboratory Diagnosis and Experimental Methods in Tuberculosis. By H. S. Willis 165
Varicose Veins. By R. Thornhill 165
Researches in Polynesia and Melanesia. Parts V—VII. By P. A. Buxton 165
Taking the Doctor's Pulse and Another Essay. By J. F. Montague .. 166
Clinical Observations on Infant Feeding and Nutrition. By H. B. Gladstone 166
Ideal Marriage: Its Physiology and Technique. By Th. H. Van de Velde 167
Appendicitis. By H. A. Royster 167
Studies on Malaria. By Sir Ronald Ross 233
Une Grande Page De L'Historie De La Médicine: La Decouverte De La Transmission Du Paludisme Par Les Moustiques. By Sir Ronald Ross 234
Aspects of Age, Life, and Disease. By Sir Humphry Rolleston .. 282
Medicine Monographs. Volume XIV. Epilepsy. By W. G. Lennox and S. Cobb 284

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

REVIEWS OF BOOKS—(*Continued*). *Page*

A Handbook on Diabetes Mellitus and Its Modern Treatment. By J. P. Bose 284
Fascial Grafting in Principle and Practice. By H. C. Ossin .. 285
Syphilis. A Treatise on Etiology, Pathology, Symptomatology, Diagnosis, Prognosis, Prophylaxis and Treatment. By H. H. Hazen .. 285
The Duodenum, Medical, Radiologic and Surgical studies. By P. Duval and others 286
Diagnosis of Children's Diseases. By E. Feer 286
Nutrition. By W. H. Eddy 286
Requisites and Methods in Surgery. By C. W. N. Cathcart 286
Clinical Surgery. By J. W. Dowden 287
Operative Surgery. By J. S. Horsely 287
Maternity and Child-Welfare. By A. P. Pillay and others 287
Physiology and Biochemistry of Bacteria. Vol. I. By R. E. Buchanan .. 288
A Textbook of Pathology. By W. G. MacCallum 288
Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus (An Anatomical Study of the Movement of Heart and Blood in Animals). By W. Harvey 289
Modern Medicine. Edited by Sir William Osler 289
Cholera and Its Treatment. By R. Guin 290
Medical and Allied Topics in Latin Poetry. By H. Oppenheimer .. 290
A Patient's Manual of Diabetes. By H. W. Moxon 290
An Index of Symptomatology. By Various Writers. 291
Nutrition in Health and Disease for Nurses. By L. F. Cooper .. 291
Food. By R. McCarrison 291
Malay Poisons and Charm Cures. By J. D. Gimlette 291
A Report on the League of Nations Interchange of Health Officers in India. By A. L. Hoops 292
Chronic (Non-Tuberculous) Arthritis: Pathology and Principles of Modern Treatment. By A. G. Timbrell Fisher 292
Substandard Lives and Their Assessment in Life Assurance. By J. J. Cursetji 292
Protozoology, A Manual for Medical Men. By J. G. Thomson .. 344
A Manual of Helminthology, Medical and Veterinary. By H. A. Baylis .. 346
Epidemiology Old and New. By Sir William Hamer 346
The Sack-'Em-Up men. By J. M. Ball 347
Hospitals and the State: A Popular Study of the Principles and Practice of Charity. By R. Westland Chalmers 347
Acute Infectious Diseases. By J. F. Schamberg and other 348
Elementary Medicine in Terms of Physiology. By D. W. Carmait Jones 348
Aids to Medicine. By J. L. Livingstone 349
The Sensory and Motor Disorders of the Heart: Their Nature and Treatment. By A. Blackhall-Morison 349
On Nephritis. By A. C. Alport 349
Blood and Urine Chemistry. By R. B. H. Gradwohl and other .. 350
Medical Adventure: Some Experiences of a General Practitioner. By E. Ward 350
Gleanings from General Practice. By D. Tindal 350
Elements of Human Anatomy and Physiology. (Hindi). Parts I and II. By T. N. Varma 350
Tumours Arising from the Blood-Vessels of the Brain. By H. Cushing and P. Bailey 350
Gonococcal Urethritis in the Male: for Practitioners. By P. S. Pelouze 351
Branchial Cysts. By H. Bailey 351
Hygiene and Public Health. By H. R. Kenwood and other 351
Surgery in the Tropics. By F. P. Connor 403

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

REVIEWS OF BOOKS—(*Continued*). *Page*

A Textbook of Medicine. By Various Authors. Edited by J. J. Conybeare 403
London Hospital Lectures on Forensic Medicine and Toxicology. By F. J. Smith 403
A Textbook of Urology. By D. N. Eisendrath and other 403
Physiotherapy in General Practice. By E. B. Clayton 404
Tropical Nursing. By A. L. Gregg 404
The Pharmacopœia of the King Edward VII Memorial Hospital, Bombay. Compiled by A. S. Erulkar 404
Health of the School Child. By P. Ahuja 404
Diseases of the Gall-Bladder and Bile Ducts. By E. A. Graham and others 405
Aids to Psychology. By J. H. Ewen 405
Insomnia and Drug Addiction. By P. C. Collingwood Fenwick .. 405
The Diagnostics and Treatment of Tropical Diseases. By E. R. Stitt .. 406
Birch's Management and Medical Treatment of Children in India. By V. B. Green-Armytage 406
Obstetric Forceps: Its History and Evolution. By K. N. Das .. 407
Diseases of Infants and Children. By H. D. Chapin 408
Surgical Pathology. By C. P. G. Wakeley and other 408
A Laboratory Manual of Physiological Chemistry. By D. W. Wilson .. 408
The Medical Annual, 1929 467
Manson's Tropical Diseases: A Manual of the Diseases of Warm Climates. Edited by P. H. Manson-Bahr 468
The Diseases of China (Including Formosa and Korea). By J. L. Maxwell 468
The Story of Modern Preventive Medicine. By Sir A. Newsholme .. 469
Far Eastern Association of Tropical Medicine. Transactions of the Seventh Congress, held in British India, December 1927, Vol. I. Edited by J. Cunningham 470
Neurological Examination. By Charles A. McKendree 470
Tuberculosis and How to Combat it: A Book for the Patient. By F. M. Pottenger 471
Fractures and Dislocations: Immediate Management after Cure, and Convalescent Treatment with Special Reference to the Conservation and Restoration of Function. By P. D. Wilson and other .. 471
Practical Clinical Laboratory Diagnosis. By C. C. Bass and other .. 471
Handbook of Bacteriology. By J. W. Bigger 471
Lippincott's Pocket Formulary. By G. E. Rehberger 472
Proceedings of the Imperial Social Hygiene Congress at the Caxton Hall, London, October 3rd to 7th, 1927 472
Technique and Method of Use of Sternberg's Gastroscopy and Gastroscopic Treatment. By W. Sternberg 472
Annual Medical List, 1929 472
Endocrine Diagnostic Charts. By H. R. Harrower 472
Elements of Surgical Diagnosis. By Sir Alfred Pearce Gould .. 472
Neuro-Surgery. By W. Sharpe 473
La Vaccination Antituberculeuse Avec Les Bacilles Vivants Chez Les Annimaux et Chez L'Homme. By A. Ascoli 473
Mental Deficiency (Amentia). By A. F. Tredgold 528
Contributions to Psychiatry, Neurology and Sociology. Dedicated to the Late Sir Frederick Mott by his Colleagues 529
Ultra-violet Radiation and Actinotherapy. By E. H. Russell and other .. 529
Light and Heat in Therapy (with a Chapter on Foam Treatment) .. 530
The Physics of X-Ray Therapy. By W. V. Mayneford 530
An Introduction to Anatomy. By N. S. Sahasrabudhe 530
Public Health and Hygiene: A Student's Manual. By C. F. Bolduan .. 530
Elements of Hygiene and Public Health. By J. P. Modi 530

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

REVIEWS OF BOOKS—(*Continued*), *Page*

The Work of Medical Women in India. By M. I. Balfour and other .. 531
Modern Pharmacology and Therapeutic Guide. By A. R. Majumdar .. 531
The Medical Museum, based on a New System of Visual Teaching. By S. H. Daukes 532
A Survey of Medical Missions in India 593
The Facts of Modern Medicine. By F. W. Palfrey 594
Percussion of the Chest. By J. B. McDougall 594
The Examination of Patients. By N. B. Foster 594
Principles and Practice of Electrocardiography. By C. J. Wiggers .. 594
Problems in Surgery, University of Washington Graduate Medical Lectures, 1927 594
General Surgery. Edited by E. A. Graham 595
Injection Treatment of Internal Hæmorrhoids. By M. C. Pruitt .. 595
Squint: Its Causes, Pathology and Treatment. By Claude Worth .. 595
Medico-Legal Problems. By L. Riddell 595
The Kahn Test: A Practical Guide. By R. L. Kahn 596
Army Health in India, Hygiene and Pathology. By J. Mackenzie .. 596
Recent Advances in Tropical Medicine. By L. Rogers 651
The Origin of Malignant Tumours. By T. Boveri 651
The Dermatergoses or Occupational Affections of the Skin. By R. P. White 651
A Short Practice of Medicine for Students and Junior Practitioners. By U. P. Basu 652
A Textbook of Pharmacology and Therapeutics. By H. A. McGuigan .. 652
A Handbook of Medical Jurisprudence and Toxicology. By A. N. Das .. 652
Alcohol and Human Life. By C. C. Weeks 652
Aids to Pharmaceutical Latin. By G. E. Trease 653
Medical Guide for India and Index of Treatment. By E. I. O'Meara .. 653
Crooks of the Underworld. By C. G. Gordon 653
Handbuch Der Tropenkrankheiten. By C. Mense 653
Cancer. By G. Jeanneney 654
Medicine, Its Contribution to Civilization. By E. B. Vedder .. 655
Leprosy in Europe, the Middle and Near East Africa. By R. G. Cochrane 704
The Science of Nutrition Simplified: A Popular Introduction to Dietetics. By D. D. Rosewarne 704
The Elements of the Science of Nutrition. By G. Lusk 704
Principles and Practice of Minor Surgery. By E. M. Foote 705
A Textbook of Fractures and Dislocations. By K. Speed 705
The Treatment of Rheumatoid Arthritis. By A. H. Douthwaite .. 705
Movable Kidney: Its Etiology, Pathology, Diagnosis, Symptoms and Treatment. By W. Billington 706
An Introduction to the Study of the Nervous System. By E. E. Hewer .. 707
Physical Diagnosis. By C. P. Emerson 707
Indigestion: Its Differential Diagnosis and Treatment. By H. G. Paterson 707
Pediatrics for the General Practitioner. By H. M. McClanaham .. 708
Bacteriology: General, Pathological and Intestinal. By A. I. Kendall .. 708
Physical Therapeutic Technic. By F. B. Granger 709
Aids to Zoology. By H. Lister 709
An Introduction to the History of Medicine. By F. H. Garrison .. 709
Principles of Pathology for Practitioners and Students. By H. D'Arcy Power and other 710
Toxæmias of Pregnancy. By H. J. Stander 710
Herman's Difficult Labour: A Guide for Students and Practitioners. By C. Oldfield 711

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CORRESPONDENCE:—

Page

Plasmoquine. F. O. Wade 58
Diphtheria in India. Durgeshwar Nande 118
Estimation of Blood Sugar. H. N. Mukherjee 118
A Case for Diagnosis. M. D. Pillai 118
The Position of the Indian Medical Councils to the General Medical Council of London and the Status of British English Medical Degrees and Diplomas. K. M. Hiranandany 177
Night Blindness and Its Speedy Cure with Liver. B. J. Bouché .. 178
Treatment of Gonorrhœa. M. S. Pal 178
Auricular Fibrillation after Aspirin. G. Arbour Stephens 178
The Ætiology of Naga Sore. H. S. Smith 239
The Intravenous Use of Pituitrin. R. K. Bhattacharya 239
Sudden Deaths in Young Females. C. G. Mahadevia 297
The Sterilization of Syringes. Jyoti Dhur Roy 297
Subcutaneous Injection of Oils or Oily Preparations. A. F. W. de Costa 297
A Simple Rat Trap. C. J. Stocker 297
A Case of Acute Vaginismus. Jyoti Dhur Roy 298
Accidental Suffocation in a Well. Rajeswar Prasad 298
A Case for Diagnosis. Ch. Krishnamurty 299
A Case for Diagnosis. (Corrigendum) 299
The Yellow Fever Danger. J. W. D. Megaw 354
Preventive Surgery. K. S. Nigam 355
Mental Hygiene in India. J. Norman Pacheco 356
The Treatment of Night Blindness. T. N. Varma 356
Melæna and Hæmatemesis in the New Born. A. Saha 356
Ascaris Infection Simulating Bright's Disease. Markandrai B. Mankad 357
A Crochet Needle as an Emergency Surgical Instrument. B. Bharadwaja 357
Neosalvarsan. Havero Trading Co., Ltd. 357
Herpes Zoster and Varicella. Bijoy Krishna Chatterjee 413
Intravenous Pituitrin. S. N. Guha 414
Intravenous Iodine. M. Aslam Omar 414
Medical Science in India. A. T. Roy 414
The Title of "Doctor." B. J. Bouché 417
Educational Cinema Films. R. G. A. Algoet 417
Lobar Pneumonia with Intermittent Temperature. Bhupendra Narayan Chakrabatty 477
The Sterilization of Hypodermic Syringes. C. S. Sharma 477
The Sterilization of Hypodermic Syringes. M. Subbiah 478
Indigenous Medicine and District Boards. D. Bharadwaja 478
A Case for Diagnosis. Ch. Krishnamurty 478
A Case for Diagnosis. S. P. Sarbadhikari 478
The Treatment of Acute Vaginismus. J. Norman Pacheco 478
The Treatment of Acute Vaginismus. Shyam Lal 479
The Treatment of Acute Vaginismus. J. N. Banerji 479
Hæmoplastin. M. Barooa 479
The Use of Pneumococcus Immunogen Combined in the Treatment of Pneumonia. A. R. D'Abreu 538
Standardized Lives and their Assessment in Life Insurance. Jehangir J. Cursetji 538
Blood Pressure in Indians. N. K. Mukerjee 598
Undescended Testis as a Cause of Physical Rejection. Rameshwar Singh 598
Khaki Drill and Skin Irritation. H. Wilkinson 598
Vomiting of "Bees." Tincori Sircar 598
A Suggested Measure in the Control of Plague. Accacio Da Gama .. 599
The Age of Consent Act. V. B. Green-Armytage 656
Peritoneal Forceps. Miss M. V. Webb 657

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CORRESPONDENCE—(*Continued*). *Page*

The Treatment of Myiasis in Lepers. E. Landeman 657
The Indian Medical Department. B. J. Bouché 658
Intravenous Iodine in Ulcus Tropicum. K. P. Sarkar and P. B. Sarkar .. 658
Tropical Dietaries. J. Neil Leitch 658
Filarial Lymphangitis. T. B. Menon 658
Sterilization of Hypodermic Syringe. G. B. Singh 659
A Case of Intolerance to Quinine. Ratanlal Maganlal Gandhi .. 659
Gonorrhœa and Its Treatment with "Acriflavin." S. P. 716
New Conceptions of Sciatic Pain and Its Treatment. G. Galstaun .. 716
Aluminium Utensils and Tuberculosis. Ikrawd Duiabbasi (Ikram-ud-Din) 717
A Case for Diagnosis. Uma Pada Mukherjee 717
Bogus "M.D.s" C. H. Karnik 717
The Sterilization of Hypodermic Syringes. K. P. Sarkar and P. B. Sircar 718
The Treatment of Vaginismus. Shailendra Mukherji 718

ANNUAL REPORTS:—

Annual Report on the Working of the G. I. P. Railway, Medical Department for the Year 1927-28 50
Annual Report of the Executive Health Officer of the City of Bombay for 1927 51
Notes on the Annual Statements of the Hospitals and Dispensaries in the Central Provinces and Berar for the year 1927 54
Madras General Hospital (1664—1928) 55
Report of the Chemical Examiner to Government, Punjab, for the Year 1927 56
Annual Report of the Ross Institute and Hospital for Tropical Diseases for 1927 57
The Rockefeller Foundation, Annual Report, 1927 111
Reports of the Infectious Diseases Hospitals of Bombay City for the Year 1927 113
Administration Report on the Jails of Bihar and Orissa for the Year 1927 114
Administration Report on the Jails of Bihar and Orissa for the Year 1926 117
Report on the Working of the Punjab Mental Hospital, Lahore, for the Year 1927 168
Annual Report of the Public Health Commissioner with the Government of India, for 1926. Vol. I, with Appendices 168
Annual Report on the Administration of Jails of the Bengal Presidency, 1927 175
Report on the Jail Administration of the Province of Assam for the Year 1927 235
Report on the Working of the Mental Hospitals in Burma for the Year 1927 236
Report on the Statistical Returns of the Provincial Mental Hospital in Assam for the Year 1927 237
Administration Report of the Baluchistan Agency for 1927-28 .. 293
Sixty-sixth Annual Report of the Government Cinchona Plantations and Factory in Bengal for the Year 1927-28 293
University of Calcutta Reports on the Students' Welfare Scheme (Health Examination) for the Year 1927 294
Fifty-third Annual Report of the Chemical Examiner's Department, Bengal, for the Year 1927 294
King Edward VII Memorial Pasteur Institute and Medical Research Institute, Shillong, the Eleventh Annual Report for the Year ending 31st December, 1927 296

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ANNUAL REPORTS.—(*Continued.*)

Page

The Sixty-fourth Annual Report of the Director of Public Health and the Thirty-eighth Annual Report of the Sanitary Engineer, Madras, 1927 352
Sixtieth Annual Report of the Director of Public Health of the United Provinces of Agra and Oudh for the Year ending 31st December, 1927 409
Annual Report on the Working of the Civil Hospitals and Dispensaries in the Madras Presidency for the Year 1927 411
Report on the Working of the Ranchi Indian Mental Hospital, Kanke, in Bihar and Orissa for the Year 1927 412
Report on the Health of the British Army, London, for the Year 1927 .. 473
Annual Report of the European Hospital for Mental Diseases at Ranchi for the Year 1927 475
London School of Hygiene and Tropical Medicine, Fourth Annual Report to the Court of Governors, 1927-28 475
Kashmir C. M. S. Mission Hospital Annual Report for 1928 .. 476
Report of the Chemical Examiner to the Government of the Punjab for the Year 1928 476
Report on the Administration of Bengal, 1927-28 532
Government Ophthalmic Hospital, Madras, Administrative Report, Statistics and Professional Report for the Year 1928 534
Annual Report for 1928 of (1) The National Association for Supplying Medical Aid by Women to the Women of India (Countess of Dufferin's Fund); (2) The Victoria Memorial Scholarships Fund; (3) The Lady Chelmsford All-India League for Maternity and Child-Welfare 536
Report of the European Mental Hospital, Ranchi, for the Year 1928 .. 597
Annual Report of the Union Mission Tuberculosis Sanatorium. Arogyavaram, near Madanapalle, South India, for 1927-28 .. 655
United Fruit Company, Medical Department, Seventeenth Annual Report, 1928 656
Sixty-first Annual Report of the Director of Public Health of the United Provinces of Agra and Oudh for the Year 1928 711
Annual Report on the Administration of Jails of the Bengal Presidency, 1928 712

NOTICES, THERAPEUTICS, DRUGS AND LITERARY:—

Methods and Problems of Medical Education 59
The Bengal Medical Association. (Opposition to the New Medical Bill) 59
Royal Institute of Public Health 60
"Cure for Leprosy" 60
Mammary Complications and their Treatment 60
A Coincidence in Pharmaceutical History 60
Centenary of King's College 119
International Medical Postgraduate Courses in Berlin 119
Smalarina Cremonese 120
Mellin's Food: A Calendar for the Year 1929 120
Notes on Burroughs Wellcome and Co.'s Exhibit at the British Medical Association Meeting at Cardiff, July 1928 120
Frank Ross and Co., Ltd. 120
Thacker, Spink and Co. 120
"The Actinic Practitioner and Electrotherapist" 120
All-India Medical Licentiates Conference, March 1929 120
Ultra-Violet Ray Irradiation 179
The 35th Chemists' Exhibition 179
A Catalogue of the Publications of Bailliére, Tindall and Cox .. 179
Calmette's Tuberculin Protective Vaccine 180
.. 180

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

NOTICES, THERAPEUTICS, DRUGS AND LITERARY—(*Continued*). *Page*

Watson's Microscope Record 180
Bengal Chemical and Pharmaceutical Works, Ltd. 180
Vitamine Therapy 240
Salvitæ 240
Crookes' Laboratories 299
Lantern Slides for Public Health Propaganda 300
Liver Extract B. D. H. 300
Immunogens, Parke, Davis and Co. 358
Quinoxyl, B. W. and Co 359
" Sparklet " Chloramine 359
Piperazine, Midy 359
" Otosclerol " 359
Bovril, Limited 360
The " Empire " Microscope 360
Hamblin's Ophthalmic Instruments and Apparatus 360
Liver Extract (Parke, Davies and Co.) 419
Pictorial Perfection in Photography 419
" Atocin " 419
A Stopper for Vacuum Flasks 419
Messrs. Behring and Co. 419
Watson's Microscope Record 419
The Treatment of Amœbic Dysentery 420
Messrs. Baird and Tatlock (London), Ltd. 420
A Sterilizing Hypodermic Syringe Case 420
Watson's Microscope Record 480
New Amœbicidal Medicament 480
Fifth International Congress of Military Medicine and Pharmacy, British Medical Association House, London, May 6th to 10th, 1929 .. 480
Watson's Instructions to Patients 539
Hygienic Linings for Goggles 539
The Quartz Lamp 539
Brand's Essence of Chicken 539
New Materials for Moulds and Casts 540
Hicks' Clinical Thermometers 540
Numotizine 540
An Inexpensive Stop-Watch 540
" Boots, Cash Chemists " 599
British Medical Association Meeting at Manchester, 1929 600
Apparatus for Radiology 600
" Infected Wound Therapy " 600
Digipan 660
Virol, Limited 660
Pacyl 660
Ingram's Rubber Products 720
Hewlett's Sodio-Calcii Lactas Tablets 720

SERVICE NOTES:—

Service Notes 58, 118, 178, 240, 299, 357, 418, 479, 538, 599, 659. 780

SUPPLEMENT:—

The Indian Medical Year, 1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

INDEX TO VOL. LXIV

OF

"THE INDIAN MEDICAL GAZETTE"

For the year 1929.

[Original Article "O. A."; Mirror of Hospital Practice "H. P."; Editorials "E."; Special Article "S. A."; Medical News "M. N."; Current Topics "C. T."; Correspondence "C."; *Italics* signify Reviews.]

Page

A

Abscess of the brain, A case of (Das Gupta) (H. P.) .. 569
——A chronic encysted mammary, simulating scirrhous cancer (Nanavatty) (H. P.) 632
——filarial, A case of (Acton and Rao) (H. P.) .. 631
——of the Iris, A case of (Hansraj) (H. P.) .. 510
Abscesses, quinine (Husain) (H. P.) 330
Acetylcholine as a depressant. (C. T.) 465
Acetylsalicylic acid and alkaline citrates. (C. T.) 466
Acnes, The (C. T.) 400
Acriflavin, Gonorrhœa and its treatment with (S. P.) (C.) .. 716
Acton, H. W. and Chopra, R. N. Kurchi Bismuthous iodide in the treatment of chronic amœbic infections of the bowel .. 481
——and McGuire, C. "Cooly Itch." A purulent folliculitis due to the trichophyton violaceum variety indicum .. 241
——and Rao, S. S. A case of filarial abscess 631
——and Rao, Sundar S. The importance of secondary infections in the causation of filarial lymphangitis 421
——and Rao, S. S. "Kataphylaxia," A Phenomenon seen clinically in filariasis 601
Adhikari, A. K. *see* Speedy, W. D. A record of malarial cases in the Bengal Nagpur Railway Construction Hospital, Titlagarh, from July 1928 to August 1929, with some observations on mosquito findings and conditions of transmission 629
Adiseshan, R. *see* Ubhaya, N. R. Maternal mortality in India: A preliminary study 550
Adrenaline, synthetic, A note on the action of (Paranjpe) (O. A.) 688
Afridi, M. K. T. A. B. Vaccine in relation to an outbreak of enteric fevers 670
Age of Consent Act. (Green-Armytage) (C.) .. 656
——determination of Indians, from a study of the ossification of the epiphyses of the long bones. (Hepworth) (O. A.) 128
Ahuja, P. Health of the School Child 404
Alastrim or small-pox (Nag) (H. P.) 90
Albumine in urine, A new test for (Bose, C.) (O. A.) .. 17
Albuminuria and Glycosuria. (C. T.) 229
Albuquerque, M. C. and Seshachalam, T. Notes on a case of human hermaphrodite .. 509
Alcohol, Observations on the excretion of, in the cerebro-spinal fluid and urine after oral administration, (Vad and Kulkarni) (O. A.) 500
Algoet, R. G. A. Educational cinema films 417
Alkaline citrates, Acetylsalicylic Acid and (C. T.) .. 466
Alkaptonuria Homogentisuria—with Glycosuria. (Bose and Ghosh) (O. A.) 61
All India Medical Congress, 1928-29. (M. N.) .. 217
Alport, A. C. On Nephritis .. 349
Aluminium utensils and tuberculosis. (Duibbasi) (C.) .. 717
American Medical Association of Vienna. (M. N.) .. 336
Amœbic abscess, Radiological examination of the liver in cases of suspected. (Barrett) (O. A.) .. 375
——dysentery, Acute, treated by Hedyotes auriculares, N. O. Rubiaceae. (Bhandarkar) (H. P.) 387
——infections of the bowel, chronic, Kurchi bismuthous iodide, its value in the treatment of (Acton and Chopra) (O. A.) 481
Amyotrophic lateral sclerosis in an East Indian, A case of (Rambo, V. C.) (H. P.) .. 22
Anæmia, Malignant, of the tropics. (Mackie) (O. A.) .. 305
Anæsthesia by apothesine in general surgery, Local (Banerjee) (O. A.) 501
——spinal, A case of aphasia during (Mudaliyar) (H. P.) .. 695
Anal fissure, Pruritus Ani and, Treatment of: the use of anæsthetic solutions in oil. (C. T.) 645
Angiomata of the head, Electro-coagulation (Surgical diathermy) in multiple (Lalvani) (H. P.) 387
Ankles, Fractures of the (C. T.) 396
Anklesaria, M. D. Detachment of the retina 186
Annual Medical List, 1929, Published by the Bengal Council of Medical Registration, Calcutta 472
Anopheline fauna of a small tank throughout the year, A note on the (Feegrade) (O. A.) .. 251
——larvicide, Paris green as an (Sur & Sarkar) (O. A.) 376
——mosquitoes of Hazaribagh, On the (Basu) (O. A.) 141
Anophelines from the Bengal Dooars, Records of (Khan) (O. A.) .. 496
——found in Baroda Camp, A note on the (Webster) (O. A.) 197
Antimony test in the diagnosis of kala-azar, Notes on The significance of the (Napier) (O. A.) 669
Antimony test in the diagnosis of kala-azar, The significance of the (Chopra & De) (O. A.) .. 661
Aphasia during spinal anæsthesia, A case of (Mudaliyar) (H. P.) 695
Aphrodisiac Remedies. By the staff of the "Practical Medicine" 48
Apothesine, Local anæsthesia by, in general surgery (Banerjee) (O. A.) 501
Appendicitis, chronic, Radiology in the diagnosis of (Barrett) (O. A.) 129
——Roundworm infection simulating (Sukhavanam) (H. P.) .. 261

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Arrhenol, A case of elephantiasis cured by (Quiyum) (H. P.) .. 450
Ascariasis simulating abdominal tumours (Henriques) (H. P.) 571
Ascaris infection simulating Bright's disease (Mankad) (C.) 357
Ascites by Novasurol and Ammonium chloride, Treatment of (C. T.) 229
Ascoli, Prof. A. La vaccination antituberculeuse les bacilles vivants chez les animaux et chez l'homme 473
Aspirin, Auricular fibrillation after (Stephens) (C.) .. 178
Asthma in children, Treatment of, with tuberculin (C. T.) 159
Atropine sulphate, A case of irreducible hernia relieved by (Pradhan) (O. A.) .. 692
Auricular fibrillation after aspirin. (Stephens) (C.) 178
Avertin rectal nacrosis. (Poduval) (O. A.) 432

B

B. coli Bacilluria, Some cases of (Reinhold and Greenway) (H. P.) 503
Bachaspati, P. K. A case for diagnosis 508
Bacillus coli septicæmia, Notes on a case of (de Castro) (H. P.) 206
Back Pain, Low. (C. T.) .. 42
Bacteriophage. The spread of dysentery in a Khasi village and its treatment with (Pal Chowdhury and Morison) (O. A.) 66
Bagchi, H. N. A case of cephalic tetanus 89
———H. N. A case of staphylococcal septicæmia .. 508
———P. C. A Heart case, for diagnosis 148
Bai Yamunabai, L. Nair Hospital, Bombay, The extension of the (M. N.) 518
Bailey, H. Branchial Cysts .. 351
Bajpayee, A. P. A case of Raynaud's disease .. 692
Balfour, M. I. and Young, R. The work of medical women in India 531
Ball, J. M. The Sac-'Em-Up Men 347
Baluchistan, *X*-ray work in, etc. (Barrett) (O. A.) .. 566
Banaji, B. P. Tattooing of the cornea with platinum chloride solution for leucoma .. 201
Banerjee, A. B. Local anæsthesia by apothesine in general surgery .. 501
———K. G. On a recent outbreak of epidemic dropsy in the district of Birbhum 181
———B. K. A case of foreign body in the vagina .. 26
———J. N. Treatment of vaginismus .. 479
———N. D. Indian dietaries in the United Provinces 183
Barium chloride in typhoid fever. (C. T.) 698
———sulphide, A case of accidental poisoning with (Singh) (H. P.) .. 506
Barker, J. E. Cancer, the Surgeon and the Researcher .. 46
Barnard, W. G. Elementary Pathological Histology .. 47
Baroda Camp, A note on the anophelines found in (Webster) (O. A.) 197
Barooa, M. Hæmoplastin .. 479

Page

Barrett, J. H. Radiological examination of the liver in cases of suspected amœbic abscess .. 375
———Radiology in the diagnosis of chronic appendicitis .. 129
———Unusual displacements of the epiphysis of the patella .. 445
———*X*-ray work in Baluchistan. The new *X*-ray and electrotherapy department of the C. M. S. Hospital, Quetta .. 566
Bass, C. C. and Johns, F. M. Practical clinical laboratory diagnosis 471
Basu, B. C. On the anopheline mosquitoes of Hazaribagh, Bihar & Orissa .. 141
———*U. P. A short practice of medicine for students and junior practitioners* .. 652
Baylis, H. A. A Manual of Helminthology, Medical and Veterinary 346
"Bees" Vomiting of (Sircar) (C.) 598
Bengal Council of Medical Registration. (M. N.) .. 640
———Dooars, Records of anophelines from the (Khan) (O. A.) 496
———Nagpur Railway Construction Hospital, Titlagarh, A record of malarial cases in the, from July 1928 to August 1929, with some observations on mosquito findings and conditions of transmission. (Speedy & Adhikari) (O. A.) .. 629
Berberine Sulphate in Oriental sore. (Devi) (O. A.) .. 139
———in the treatment of oriental sore (Das Gupta and Dikshita) (O. A.) .. 67
Berlin, International Medical Post-Graduate Courses in (M. N.) 453
Bethea, O. W. Clinical Medicine 49
Bhaduri, G. B. The use of pneumococcus immunogen combined in the treatment of pneumonia 301
Bhandarkar, P. R. Acute amœbic dysentery treated by Hedyotes auriculares, N. O. Rubiaceae .. 387
Bharadwaja, D. A crochet needle as an emergency surgical instrument .. 357
———Indigenous medicine and district boards .. 478
Bhatia, S. L. The spleen .. 453
———The vital capacity of the lungs .. 519
Bhattacharya, R. K. The intravenous use of Pituitrin .. 239
Bigger, J. W. Handbook of Bacteriology 471
Bijnor, Kala-azar in (Umar) (O. A.) 322
Bile in the peritoneal cavity, A case of free (Siddiqi) (H. P.) 385
Billington, W. Movable Kidney: its etiology, pathology, diagnosis, symptoms and treatment .. 706
Binding of *Indian Medical Gazette* Volumes 335

Page

Birbhum, Epidemic dropsy in (Ghosh) (O. A.) .. 182
———On a recent outbreak of epidemic dropsy in the district of (Banerjee) (O. A.) 181
Birnagar, Malaria control at (Bose) (S. A.) 323
Blackhall-Morison, A. The sensory and motor disorders of the heart: their nature and treatment 349
Blackwater fever, Retention of urine in (Nag) (H. P.) .. 505
———The treatment of, by oral sodium bicarbonate (C. T.) 592
Bladder, A case of rubber catheter inside the (Dutt Gupta) (H. P.) .. 210
———A distended, simulating a full-term uterus (Das Gupta) (H. P.) .. 450
Bleeding from the breast, A case of (Sinha and Mukherjee) (H. P.) 149
Blindness, Causes of (Gnanadikam) (O. A.) .. 194
———in India, Preventable (E.) 513
Blood agar slope, The superimposed (Gore) (O. A.) 429
———changes associated with liver diet in young convalescents (C. T.) .. 30
———donors, dangerous (Lloyd and Chandra) (O. A.) .. 361
———pressure in Indians (Mukerjee) (C.) .. 598
———sugar, estimation of (Mukherji) (C.) .. 118
———tests in relation to blood transfusion (Lloyd) (O. A.) 121
———transfusion, Blood tests in relation to (Lloyd) (O. A.) 121
———urea applicable at the bedside, A simple method for the estimation of (Mukherjee) (O. A.) .. 252
"Blood-worms," The carnivorous habits of Indian (Mukerji) (O. A.) 323
Boldaun, C. F. Public health and hygiene: A Students' Manual .. 530
Bombay, The extension of the Bai Yamunabai L. Nair Hospital (M. N.) .. 518
———Medical Council (M. N.) 335
Borel, E. and Labernadie, V. G. F. A list of the species of mosquitoes collected in the French Settlements in India .. 495
Bose, C. A new test for albumin in urine 17
———*J. P. Handbook on Diabetes Mellitus and its Modern Treatment* .. 284
———J. P. and Ghosh, S. Homogentisuria with Glycosuria. With notes on a detailed clinical and chemical investigation of a case 61
———K. Proceedings of a conference held at Birnagar (Bengal) on the 24th February, 1929, to discuss the problem of malaria control at Birnagar .. 323
———S. C. An interesting case of recurrent pregnancy toxæmia 202
Bouché, B. J. The Indian Medical department .. 658
———Night blindness and its speedy cure with liver .. 178
———The title of "doctor" 417
Boveri, T.—The origin of Malignant Tumours .. 651

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Boyd, T. C. and Roy, A. C. A coat effect observed in mice when fed with fats under certain conditions .. 564
——T. C. and Roy, A. C. A preliminary note on a colour reaction for "693" and its application in the estimation of that compound in the urine .. 382
Bradfield, E. W. C. and Vasudevan, A. Gastric Syphilis .. 125
Brain, A case of abscess of the (Das Gupta) (H. P.) .. 569
Breast, A case of bleeding from the (Sinha and Mukherjee) (H. P.) 149
Bright's disease, Ascaris infection simulating (Mankad) (C.) .. 357
British Empire Cancer Campaign, The Garton Prize and Medal (M. N.) .. 392
——English Medical degrees and diplomas, The position of the Indian Medical Council of London and the status of (Hiranandany) (C.) .. 177
——Journal of Urology (M. N.) 337
——Social Hygiene Council (M. N.) 639
——*Social Hygiene Council—Proceedings of the Imperial social hygiene congress at Caxton Hall, London, S.W.1. October 3rd to 7th, 1927* .. 472
Broderick, F. W. Dental Medicine 110
Bromsulphalein test of liver function (C. T.) .. 30
Brousseau, K. Mongolism: A study of the Physical and Mental Characteristics of Mongolian Imbeciles 43
Brown, W. L. The Endocrines in General Medicine .. 48
Buchanan, R. E. and Fulmer, E. I. Physiology and Biochemistry of Bacteria, Vol. I. 288
Burns and scalds, Treatment of, by tannic acid (C. T.) .. 341
Burton, P. A. Researches in Polynesia and Melanesia, Parts V—VII .. 165

C

C. M. S. Hospital, Quetta, The new X-ray and electrotherapy department of the (Barrett) (O. A.) 566
Cæsarean section. Some types and their uses (McSwiney) (O. A.) 5
Calcium therapy, Intravenous (Iyer) (O. A.) .. 77
Calcutta School of Tropical Medicine (D. T. M. Result, 1929) (M. N.) .. 273
Cambridge University diploma in medical radiology and electrology (M. N.) 215
Cancer Campaign, The British Empire. The Garton Prize and Medal (M. N.) .. 392
Cancer, A chronic encysted mammary abscess simulating scirrhous (Nanavaty) (H. P.) 632
Carbon Tetrachloride, Notes on the use of (Nag) (O. A.) .. 683
Carcinoma of the cervix uteri, On the rationale of treatment of (Mitra) (O. A.) .. 316
Cardio-vascular and renal disease, Combined drug therapy in some problems of (C. T.) .. 396
Care of Infants in India: A work for Mothers and Nurses in India 49
Carnivorous habits of Indian "Blood-Worms" (Mukerji) (O. A.) 323
Cataract extraction at the Raipur Main Hospital by Smith's method with a flap of conjunctiva, Analysis of a hundred cases of (Nanhorya) (O. A.) 193
Cathcart, C. W. N. and Hartley, J. N. J. Requisites and Methods in Surgery .. 286
Cattell, H. W. Edited by International Clinics (A Quarterly Journal), Vol. I, 1928 .. 49
Cerebral symptoms caused by *Plasmodium vivax* (Das Gupta) (H. P.) 507
Cerebro-spinal fluid, The interpretation of reports on the (C. T.) 40
——and urine after oral administration, Observations on the excretion of alcohol in the (Vad and Kulkarni) (O. A.) .. 500
Cervix uteri, Carcinoma of the, On the rationale of treatment of (Mitra) (O. A.) .. 316
Chakrabatty, B. N. Lobar pneumonia with intermittent temperature 477
Chalmers, R. W. Hospitals and the state: A popular study of the principles and practice of charity 347
Chandra, S. N. *see* Lloyd, R. B. Dangerous blood donors .. 361
Chapin, H. D. and Royster, L. T. Diseases of infants and children 408
Charas, The valuation of (Chatterji and Roy) (O. A.) .. 373
Chatterjee, B. K. Herpes zoster and varicela .. 413
——R. A case of enteric in which the Widal reaction became positive on the 49th day 695
Chatterji, C. D. A case of variola treated by vaccination .. 569
——D. N. and Roy, M. B. The valuation of Charas .. 373
Chaudhuri, J. R. Goitre in Multan district 492
Chaulmoogra oil in the treatment of trachoma (Gubbay) (O. A.) 563
Chemotherapeutic investigations with antimony preparations in the experimental kala-azar of the Hamster (Roehl) (O. A.) 563
Chemotherapy (E.) .. 213
Cholera control, A district scheme for (Pereira) (S. A.) .. 455
——in infants, A note on (Das Gupta) (O. A.) .. 489
——A note on the value of medicinal treatment in (Tomb) (O. A.) .. 246
——The value of preventive inoculation against (Jolly, DaCosta and Shoung) (O. A.) .. 618
Chopra, R. N. *see* Acton, H. W. Kurchi Bismuthous Iodide, its value in the treatment of chronic amœbic infections of the bowel .. 481
Chopra, R. N. and De, P. Observations on the potency of Indian digitalis .. 312
——and De, N. N. The significance of the antimony test in the diagnosis of kala-azar .. 661
——Dikshit, B. B. and Pillai, K. V. A preliminary note on the action and uses of pseudo-ephedrine .. 1
——and Ghosh, S. Terminalia Arjuna: Its chemistry, pharmacology and therapeutic action 70
——and Sundar Rao, S. Studies in the treatment of filariasis .. 130
"Chorea," An interesting case of (Imam) (H. P.) .. 208
Christian, F. An undescended testicle in an unusual position 87
Chyluria after confinement, Occurrence of (Sundar Rao) (H. P.) 87
Cinema films, Educational (Algoet) (C.) .. 417
Civilization, The origin of (C. T.) 229
Clayton, E. B. Physiotherapy in General Practice .. 404
Climate, the effect of, and of the seasons on body-weight in pulmonary tuberculosis, A comparative study of the (Pai) (O. A.) 496
Coat effect observed in mice when fed with fats under certain conditions (Boyd and Roy) (O. A.) 564
Cochrane, R. G. Leprosy in Europe, the Middle and Near East Africa .. 704
Colles's fracture: An efficient and economical method of splinting (C. T.) 528
Connor, Sir F. P. Surgery in the Tropics 403
Conybeare, J. J. Edited by—(by various authors). A Textbook of Medicine 403
"Cooly Itch." A purulent folliculitis due to the trichophyton violaceum variety indicum (Acton and McGuire) (O. A.) 241
Cooper, L. F., Barber, E. M. and Mitchell, H. S. Nutrition in Health and Disease for Nurses 291
Cornea, Tattooing of the, with platinum chloride solution for leucoma (Banaji) (O. A.) .. 201
Corrigendum. The Indian Medical Year, 1928 335
"Crescent carriers," The treatment of, with plasmoquine compound (C. T.) .. 527
Crile, G. W. Problems in surgery, University of Washington Graduate Medical Lectures, 1927 594
Crochet needle as an emergency surgical instrument (Bharadwaja) (C.) 357
Crozier, G. G. Leprosy in Manipur State 315
Crude oil products of the Burma Oil Co., Ltd., Rangoon, larvicide, results of experiments with (Feegrade) (O. A.) .. 255
——The use of, as the larvicide of preference on the Isthmus (C. T.) 277

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Cunningham, J. Edited by Far Eastern Association of Tropical Medicine. Transactions of the 7th Congress, held in British India, December 1927, Vol. I. 470
Cursetji, J. J. Substandard Lives and Their Assessment in Life Assurance .. 292
——Standardized lives and their assessment in life insurance .. 538
Cushing, H. and Bailey, P. Tumours arising from blood-vessels of the brain .. 350
Cystotomy, Suprapubic, The indications for (Ghose) (O. A.) .. 687

D

D'Abreu, A. R. The use of pneumococcus immunogen combined in the treatment of pneumonia 538
D'Cruz, J. M. *see* Pereira, C. R. A case of hyperpyrexia for diagnosis 260
D. T. M. (Bengal) Pass List 1929 (M. N.) 273
DaCosta, A. F. W. Subcutaneous injection of oils or oily preparations .. 297
——J. J. G. *see* Jolly, G. and Shoung, Ah. The value of preventive inoculation against cholera .. 618
Dakshinamurthi, T. S. A case of volvulus of the large intestine at the splenic flexure .. 256
——An interesting case .. 21
Dalal, K. R. Report on the investigation of an outbreak of epidemic dropsy in Rangoon in the year 1924 .. 19
Dangerous diseases, Notification of (E.) 211
Das, A. N. A Handbook of Medical Jurisprudence and Toxicology 652
——*J. L. Manual of Hygiene and Public Health* 110
——*K. N. Obstetric forceps: its history and evolution* .. 407
Das Gupta, B. M. and Dikshit, B. B. Berberine in the treatment of oriental sore .. 67
——C. C. A distended bladder simulating a full-term uterus .. 450
——C. R. Cerebral symptoms caused by *Plasmodium vivax* .. 507
——J. A note on cholera in infants .. 489
——S. C. A case on an abscess of the brain .. 569
——S. C. A case of Ivory-grafting .. 205
Daukes, S. H. The Medical Museum, based on a new system of visual teaching .. 532
Dave, I. S. A case of exfoliative dermatitis after neosalvarsan injections 209
David, J. C. and Vareed, C. A preliminary note on the action of vasopressin and oxytocin .. 73
Dawson, W. S. Aids to Psychiatry 108
DeCastro, A. B. Notes on a case of *Bacillus coli* septicæmia .. 206
——An interesting early right-sided goitre 207

Page

De Lamar Lectures, 1926-1927. By several authors .. 107
De, N. N. *see* Chopra, R. N. The significance of the antimony test in the diagnosis of kala-azar 661
——P. *see* Chopra, R. N. Observations on the potency of Indian digitalis .. 312
de Takats, G. Local Anæsthesia 45
Death, The microscopical changes occurring in organs after (C. T.) 463
Deaths, sudden, in young females (Mahadevia) (C.) .. 297
Dengue fever (C. T.) .. 274
Dental disease and dietetic deficiency (C. T.) .. 160
——sepsis, focal and residual, Some aspects of (C. T.) .. 338
Dermal Leishmaniasis, A case of post - kala-azar (Dey) (H. P.) .. 147
——Leprosy and, Three cases of combined (Napier and Henderson) (H. P.) .. 446
Dermatology and syphilology, The Eighth International Congress of (M. N.) 578
Devi, A. L. Berberine sulphate in oriental sore 139
Dey, N. C. A case of post-kala-azar dermal leishmaniasis .. 147
Dhunjibhoy, J. E. Encephalitis Lethargica, etc 362
Diabetes mellitus, *Gymnema sylvestre* in (C. T.) .. 39
Diagnosis, A case for (Bachaspati) (H. P.) 508
——A case for (Krishnamurty) (C.) .. 478
——A case for (Mukherji) (C.) 717
——A case for (Pillai) (C.) 118
Diaphysial aclasis, A further case of, with a marked family history (Stott and Lall) (H. P.) 258
——(multiple exostosis) in Indians, etc. Seven cases of (Stott, H. and Lall) (O. A.) 9
Dietaries, Tropical (Leitch) (C.) 658
Dietary of the Indian community to secure a higher degree of health and efficiency, A suggestion for improvement in the (Mallannah) (O. A.) .. 199
Dietetic deficiency, Dental disease and (C. T.) .. 160
Digitalis, Indian, Observations of the potency of (Chopra and De) (O. A.) 312
Dikshit, B. B. *see* Chopra, R. N. and Pillai, K. V. A preliminary note on the action and uses of pseudo-ephedrine .. 1
——B. B. *see* Das Gupta, B. M. Berberine in the treatment of oriental sore 67
Diphtheria in India (Nande) (C.) 117
Diploma in Public Health, Regulations for (M. N.) .. 640
Distemper (E.) .. 270
District Boards, Indigenous Medicine and (Bharadwaja) (C.) 478
——Scheme for Cholera control (Pereira) (S. A.) 455
Diverticulum of the œsophagus (Torpy) (H. P.) .. 511
"Doctor," The title of (Bouché) (C.) 417

Page

Douthwaite, A. H. The treatment of Rheumatoid arthritis .. 705
Dowden, J. W. Clinical Surgery 287
Drop Regulator, An improvised (Spittel) (O. A.) .. 192
Drug therapy, combined, in some problems of cardio-vascular and renal disease (C. T.) .. 396
Duiabbasi, I. Aluminium utensils and tuberculosis .. 717
Duke-Elder, W. S. The practice of refraction .. 111
Duodenal ulcer, A modified Sippy's line of treatment in (Vad and Kulkarni) (O. A.) 196
——ulceration, gastric or, The medical management of a case of (C. T.) .. 643
Dutt, K. N. Breath sucker snakes 201
Dutta, P. C. An analysis of 675 cases of puerperal morbidity treated in the Rotunda hospital, Dublin 435
Dutt Gupta, A. K. A case of rubber catheter inside the bladder 210
Duval, P., Roux, J. C. and Beclese, H. The Duodenum, Medical Radiologic and Surgical Studies 286
Dysenteries and their sequelæ, Eight years' experience of yatren in the treatment of amœbic and bacillary (C. T.) .. 276
Dysentery in the Central Jail, Rajahmundry, Madras Presidency (Krishnamurty) (O. A.) .. 679
——The spread of, in a Khasi village and its treatment with bacteriophage (Pal Chowdhury and Morison) (O. A.) .. 66

E

Ectopic gestation, A case of (Ghosh) (H. P.) .. 385
Eddy, W. H. Nutrition .. 286
Eisendrath, D. N. and Rolnick, H. C. A Textbook of Urology 403
Electrical apparatus, Electrocution from (C. T.) .. 467
Electro-coagulation (Surgical diathermy) in multiple angiomata of the head (Lalvani) (H. P.) 387
Electrocution from electrical apparatus (C. T.) .. 467
Elephantiasis cured by arrhenol, A case of (Quiyum) (H. P.) .. 450
Emerson, C. P. Physical diagnosis 707
Emil Von Behring (C. T.) .. 281
Empyema, Modern surgery in the treatment of (C. T.) 701
——Remarks on the treatment of (C. T.) .. 397
Encephalitis lethargica; a brief description of the disease, with short notes on the post-encephalitic lethargic cases treated at the Ranchi Indian Mental Hospital (Dhunjibhoy) (O. A.) 362
Entamœba histolytica, The life history of (E.) .. 331
Enteric, A case of, in which the Widal reaction became positive on the 49th day (Chatterjee) (H. P.) 695
Enteric fevers, T. A. B. Vaccine in relation to an outbreak of (Afridi) (O. A.) .. 670
Entropion of the upper lid, Webster's operation for (Wright) (O. A.) 549

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Epidemic dropsy in Birbhum (Ghosh) (O. A.) 182
——in the district of Birbhum (Banerjee) (O. A.) .. 181
——in Rangoon, in the year 1924, Report on the investigation of an outbreak of (Dalal, K. R.) (O. A.) .. 19
Epidemic jaundice (Weil's disease) or malaria in Kandi subdivision of Murshidabad in 1928 (Sur and Sarkar) (O. A.) .. 619
Epiphyses of the long bones, On the determination of age in Indians, from a study of the ossification of the (Hepworth) (O. A.) .. 128
——patella, Unusual displacements of the (Barrett) (O. A.) .. 445
Ergosterol, Erradiated, as a wound dressing (C. T.) .. 229
Erulkar, A. S. (compiled by)—The Pharmacopœia of the King Edward VII Memorial Hospital, Bombay 404
Erythrocyte sedimentation test in leprosy, The (Muir) (O. A.) 488
Ewen, J. H. Aids to Psychology 405
Exercise in the tropics (E.) .. 451
Exfoliative dermatitis after neosalvarsan injections, A case of (Dave) (H. P.) .. 209
Eye of the new born, Silver nitrate in the (C. T.) .. 231

F

Facial neuralgias (C. T.) .. 699
Fæcal tumour in the scrotum, A case of inguinal hernia with a (Ghosh and Mitter) (H. P.) .. 208
Fæces, containing hookworm eggs. A simple method of preserving (C. T.) 464
Far Eastern Association of Tropical Medicine (M. N.) .. 214
Feegrade, E. S. Experiments with isotex as a larvicide 252
——A note on the anopheline fauna of a small tank throughout the year 251
——Results of experiments with crude oil products of the Burma Oil Co., Ltd., etc. .. 255
Feer, E. Diagnosis of Children's Diseases 286
Fenn, V. W. *see* Jolly, G. G. A year's record of kata-thermometer readings at Rangoon .. 319
Fenwick, P. C. C. Insomnia and Drug Addiction .. 405
Fibrolysin in leprosy, The use of (Figueredo) (O. A.) .. 426
Fifield, L. R. The pathology, diagnosis and treatment of neoplasms originating in the walls of the urinary bladder .. 109
Figueredo, N. The use of fibrolysin in leprosy .. 426
Filarial abscess, A case of (Acton and Rao) (H. P.) .. 631
——lymphangitis (Menon) (C.) 658
——lymphangitis, The importance of secondary infections in the causation of filarial lymphangitis (Acton and Rao) (O. A.) .. 421

Page

Filariasis, "Kataphylaxia," a phenomenon seen clinically in filariasis (Acton and Rao) (O. A.) .. 601
——Research in (E.) .. 633
——Studies in the treatment of (Chopra and Sundar Rao) (O. A.) .. 130
Filtrable viruses, Recent researches on the (E.) .. 267
Filtrable viruses, Recent work on the (E.) 272
Fingers (two), Congenital deficiency and their metacarpal bones (Jamal-ud-din) (H. P.) 150
Fisher, A. G. T. Chronic (Non-tuberculous) Arthritis: Pathology and Principles of Modern Treatment 292
Fistula, Vesico-vaginal, A further note on the treatment of, by rectal transplantation of the ureters (Fraser) (O. A.) 677
——vesico-vaginal, The treatment of, by rectal transplantation of the ureters (Fraser) (O. A.) .. 301
Flagg, P. J. The Art of Anæsthesia 42
Focal infection, Remarks on the Gall-bladder in relation to (C. T.) 698
Folliculitis, A purulent, due to the trichophyton violaceum variety indicum. (Cooly Itch) (Acton and McGuire) (O. A.) .. 241
Foot-and-mouth Disease (E.) .. 271
Foote, E. M. and Other. Principles and Practice of minor surgery 705
Forceps, Peritoneal (Webb) (C.) 657
Foster, N. B. The examination of patients 594
Fracture treatment to-day (C. T.) 162
Fractures of the ankles (C. T.) 396
Fraser, F. C. A further note on on the treatment of vesico-vaginal fistula by rectal transplantation of the ureters .. 677
——J. C. The treatment of vesico-vaginal fistula by rectal transplantation of the ureters 301
French settlements in India, A list of the species of mosquitoes collected in the (Borel and Labernadie) (O. A.) .. 495

G

Gall-bladder in relation to focal infection, Remarks on the (C. T.) 698
Galstaun, G. New conceptions of sciatic pain and its treatment 716
Gama, A. D. A suggested measure in the control of plague 599
Gandhi, R. M. A case of intolerance to quinine 659
Garrison, F. H. An introduction to the history of medicine, 1929 709
Garton Prize and Medal. The British Empire Cancer Campaign (M. N.) .. 392
Gastric or duodenal ulceration, The medical management of a case of (C. T.) .. 643
Germuth, F. G. The effect of tetronal on the production of hæmatoporphyrin in the urine 491
Gharpure, P. V. Nervous manifestations in tuberculous infections 565
——A note on museum making .. 678

Page

Gharpure, P. V. and Latey, S. G. An enquiry into the physical conditions of Indian labour .. 673
Ghosh, A. N. A case of ectopic gestation 385
——A. N. The indications for suprapubic cystotomy .. 687
——B. *see* Sur, S. N. A malaria survey of Madarihat and its environs .. 558
——D. N. and Mitter, A. K. A case of inguinal hernia with a fæcal tumour in the scrotum 208
——N. Perthe's disease .. 441
——N. An unusual complication of kala-azar .. 205
——S. *see* Chopra, R. N. Terminalia Arjuna: Its chemistry, pharmacology and therapeutic action .. 70
——S. *see* Bose, I. P. Homogentisuria with Glycosuria. With notes on detailed clinical and chemical investigation of a case .. 61
——U. Epidemic dropsy in Birbhum 182
Gill, C. A. The present position of medical science in India .. 152
Gimlette, J. D. Malay Poisons and Charm Cures .. 291
Gladstone, H. B. Clinical observations on infant feeding and nutrition 166
"Glandular fever," A case of (Norrie) (H. P.) .. 328
Glycosuria, Albuminuria and (C. T.) 229
——Homogentisuria with, etc. (Bose and Ghosh) (O. A.) .. 61
Gnanadikam, G. J. Causes of blindness 194
Gnathostome in India, A case of human infection with a (Maplestone) (O. A.) .. 610
Goitre, cystic, A case of unusually large (Irvine) (H. P.) .. 149
——in the Multan district (Chaudhuri) (O. A.) .. 492
——right-sided, An interesting early (DeCastro) (H. P.) 207
Gonorrhœa, Treatment of (Pal) (C.) 178
——and its treatment with acriflavin (S. P.) (C.) 716
Gordon, C. G. Crooks of the Underworld 653
Goré, S. N. The superimposed blood agar slope .. 429
Gould, Sir A. P. Elements of surgical diagnosis .. 472
——*G. M. A Pocket Medical Dictionary* 46
Gradwohl, R. B. H. and Gradwohl, I. E. Blood and Urine Chemistry 350
Graham, E. A., Cole, W. H., Copher, G. H. and Moore, S. Diseases of the Gall-bladder and bile ducts .. 405
——*Edited by—General Surgery* .. 595
Granger, F. B. Physical therapeutic technic .. 709
Graves, W. P. Gynæcology .. 108
Gregg, A. L. Tropical Nursing 404
Green-Armytage, V. B. The age of consent act (C.) 656
——*Birch's Management and Medical Treatment of Children in India* .. 406

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Green-Armytage, V. B. Some reflections on obstetrics and gynæcology during 1928 261
——— *Tropical Gynæcology (Clinical Lectures)* 50
Green, R. Notes on the detection in the urine of some drugs used for the treatment of malaria 614
Greenway, L. A. N. *see* Reinhold, C. H. Some cases of *B. coli* bacilluria 503
Greval, S. D. S. A simple method of standardizing the red cell suspension in connection with the Wassermann reaction .. 673
Guaiacol, Iodised tincture of, in the treatment of synovial and serous affections (C. T.) .. 395
Gubbay, R. Chaulmoogra oil in the treatment of trachoma .. 563
Guha, S. N. Intravenous pituitrin 414
Guin, R. Cholera and its treatment 290
Gwalior, Naga sores in (Khandehar) (H. P.) .. 696
Gymnema sylvestre in diabetes mellitus (C. T.) .. 39
Gynæcology, Obstetrics and, Some reflections on (Green-Armytage) (S. A.) 261

H

Hæmatemesis, Melæna and in the new born (Saha) (C.) 356
——— Melæna and, in a newly born baby (Sen Gupta) (H. P.) .. 25
Hæmatoporphyrin in the urine, The effect of tetronal on the production of (Germuth) (O. A.) 491
Hæmoplastin (Barooa) (C.) .. 479
——— A further note on the action of (Lahiri) (H. P.) .. 256
Halder, K. C. *see* Napier, L. E. A case of induced polyleucocythæmia 382
Halliburton, W. D. and Macdowall, R. G. S. Handbook of Physiology 107
Ham, B. B. Handbook of Sanitary Law 43
Hamer, W. Epidemiology old and new 346
Hamster, Chemotherapeutic investigations with antimony preparations in the experimental kala-azar of the (Roehl) (O. A.) 563
Hance, J. B., Mody, N. C. and Ujwal, S. D. Notes on the new conceptions of sciatic pain and on its treatment .. 541
Hansraj, J. A case of abscess of the Iris 510
Hari, D. L. Unusual intra-uterine tumours .. 449
Harrower, H. R. Endocrine diagnostic charts 472
Harvey, W. Exercitatio Anatomica De Motu Cordis et Sanguinis in Animalibus (an anatomical study of the movement of Heart and Blood in Animals) 289
Havero Trading Co., Ltd. Neosalvarsan 357
Hawley, H. *see* Megaw, J. W. D. Simple tests for stock solutions of quinine and potassium iodide 378
Hazaribagh, On the anopheline mosquitoes of (Basu) (O. A.) 141

Page

Hazen, H. H. Syphilis. A Treatise on Etiology, Pathology, Symptomatology, Diagnosis, Prognosis, Prophylaxis and Treatment 285
Heart case for diagnosis (Bagchi) (H. P.) 148
Hedyotes auricularis, N. O. Rubiaceæ, Acute amœbic dysentery, treated by (Bhandarkar) (H. P.) 387
Heitzmann, L. Urinary analysis and diagnosis by microscopical and chemical examination .. 109
Henderson, J. M. *see* Muir, E. An obscure neurological case simulating early leprosy .. 386
——— J. M. *see* Napier, L. E. Three cases of combined leprosy and dermal leishmaniasis 446
Henriques, J. F. Ascariasis simulating abdominal tumours .. 571
——— J. F. A case of accidental suffocation in a well 570
Hepworth, S. M. On the determination of age in Indians from a study of the ossification of the epiphyses of the long bones .. 128
Hermaphrodite, Human, Notes on a case of (Albuquerque and Seshachalam) (H. P.) .. 509
Hernia, A case of irreducible, relieved by atropine sulphate (Pradhan) (H. P.) 692
——— Inguinal with a fæcal tumour in the scrotum, A case of (Ghose and Mitter) (H. P.) .. 208
Herpes Zoster and Varicella (Chatterjee) (C.) .. 413
Hewer, E. E. and other. An introduction to the study of the nervous system .. 707
Hewlett, A. W. Pathological Physiology of internal diseases 165
Himalayan Journal (M. N.) .. 336
Hiranandany, K. M. The position of the Indian Medical Councils to the General Medical Council of London and the status of British English Medical degrees and diplomas .. 177
Hollander, B. Methods and Uses of Hypnosis and self hypnosis .. 43
Homogentisuria (Alkaptonuria) with glycosuria, with notes on a detailed clinical and chemical investigation of a case (Bose and Ghosh) (O. A.) .. 61
Honours List, The Indian, 1st March, 1929 (M. N.) .. 215
Hookworm disease, Tetrachlorethylene in the treatment of (Maplestone and Mukerji) (O. A.) .. 424
——— eggs, A simple method of preserving fæces containing (C. T.) .. 464
——— larvæ from cultures, Migration of (C. T.) .. 34
Hookworms in India, The species distribution of (Maplestone) (O. A.) 371
Hoops, A. L. A Report on the League of Nations Interchange of Health Officers in India .. 292
Horder, Sir Thomas and Gow, A. E. The Essentials of Medical Diagnosis 49
Horsley, J. S. Operative Surgery 287
Husain, A. Quinine abscesses .. 330
——— M. A. Two cases of surgical interest .. 85
——— S. M. A case of urticaria 692
Hydrocele, A radical cure for, by quinine injection (Sharma) (H. P.) 571

Page

Hyperpyrexia for diagnosis, A case of (Pereira and D'Cruz) (H. P.) .. 260
——— for diagnosis, A case of (Sarbadhikari) (C.) .. 478
Hypodermic syringe, sterilization of (Singh) (C.) .. 659
——— syringes, The sterilization of (Sharma) (C.) .. 477
Hysteria, A case of (Kamath and Kutumbiah) (H. P.) .. 87

I

Imam, S. B. An interesting case of "Chorea" 208
Immunogen, pneumococcus, The use of, combined in the treatment of pneumonia (Bhaduri) (O. A.) 301
India, Hookworms in, The species distribution of (Maplestone) (O. A.) 371
——— Medical policy in (C. T.) 337
——— The need for a Therapeutic Substances Act for (E.) .. 389
——— Preventable blindness in (E.) 513
——— William Harvey's message to (McRobert) (S. A.) .. 225
Indian community, A suggestion for improvement in the dietary of the, to secure a higher degree of health and efficiency (Mallannah) (O. A.) 199
——— dietaries in the United Provinces (Banerji) (O. A.) 183
——— labour, An enquiry into the physical conditions of (Gharpure and Latey) (O. A.) 673
——— Medical Council, The position of the, to the General Medical Council of London and the status of British English Medical degrees and diplomas (Hiranandany) (C.) 177
——— Medical Department (Bouché) (C.) .. 658
——— Medical Year, 1928: Corrigendum .. 335
——— Science Congress, 1930 (M. N.) 214
——— Science Congress, 1930 (M. N.) 517
Indigenous Medicine and District Boards (Bharadwaja) (C.) .. 478
Infants, A note on cholera in (Das Gupta) (O. A.) .. 489
Influenza (C. T.) .. 281
Insanity, temporary, following an attack of malaria (Sen Gupta) (H. P.) 507
Insulin, The intranasal application of (C. T.) 467
Interesting case, An (Dakshinamurthi) (H. P.) .. 21
International Congress of dermatology and syphilology, The eighth (M. N.) 578
Intestine at the splenic flexure, A case of volvulus of the large (Dakshinamurthi) (H. P.) .. 256
Intranasal application of insulin (C. T.) 467
Iodine, Intravenous (Omar) (C.) 414
——— intravenous in ulcus tropicum (Sarkar and Sarkar) (C.) 658
Iris, A case of abscess of the (Hansraj) (H. P.) .. 510

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Irvine, G. M. A case of unusually large cystic goitre .. 149
——A review of malaria during 1928 in a minor hill station in the Punjab .. 307
Isotex as a larvicide, Experiments with (Feegrade) (O. A.) .. 252
Ivory-grafting, A case of (Das Gupta) (H. P.) .. 205
Iyengar, M. O. T. Mosquitoes in Relation to Disease .. 44
Iyer, M. A. K. A case of rat-bite fever 571
——S. R. Intravenous calcium therapy 77
——U. A. K. Apyrexial pneumonia .. 207

J

Jamaluddin. Congenital deficiency of two fingers and their metacarpal bones .. 150
Jaundice Acholuric, A case of (Kamath and Kutumbiah) (H. P.) 26
Jeanneney, G. Cancer .. 654
John, H. J. Diabetic Manual for Patients 49
Jolly, G. G., DaCosta, J. J. G. and Shoung, Ah. The value of preventive inoculation against cholera .. 618
——and Fenn, V. W. A year's record of Kata-thermometer readings at Rangoon 319
——*see* Mackey, G. Observations on a series of bacteriological examinations of tube well water in Rangoon .. 624
Jones, D. W. C. Elementary Medicine in terms of Physiology 348
Joslin, E. P. The treatment of diabetes mellitus .. 109
Journal of Nutrition (M. N.) .. 453
Jung, C. G. Two essays on analytical psychology .. 110

K

Kahn, R. L. The Kahn Test: A Practical Guide .. 596
Kala-azar in Bijnor (Umar) (O. A.) .. 322
——of the Hamster, Chemotherapeutic investigations with antimony preparations in the experimental (Roehl) (O. A.) .. 563
——The intensive treatment of by neostibosan; Part II (Napier and Mullick) (O. A.) .. 314
——Notes on the significance of the antimony test in the diagnosis of (Napier) (O. A.) .. 669
——The significance of the antimony test in the diagnosis of (Chopra and De) (O. A.) .. 661
——An unusual complication of (Ghosh) (H. P.) 205
Kamath, M. L. and Kutumbiah, P. A case of acholuric jaundice .. 26
——M. L. and Kutumbiah, P. A case of hysteria .. 87
Karamchandani, P. V. Plasmochin compositum in the treatment of malaria 626
Karnik, C. H. Bogus "M.Ds" .. 717

Page

"Kataphylaxia," a phenomenon seen clinically in filariasis (Acton and Rao) (O. A.) .. 601
Kata-thermometer readings at Rangoon, A year's record of (Jolly and Fenn) (O. A.) .. 319
Kendall, A. I. Bacteriology: general, Pathological and intestinal 708
Kenwood, H. R. Hygiene and Public Health 351
Kerr, I. Notes on the value of the sedimentation test in the treatment of leprosy .. 247
Khaki drill and skin irritation (Wilkinson) (C.) .. 598
Khan, B. M. Records of anophelines from the Bengal Dooars 496
Khandekar, K. G. Naga sores in Gwalior .. 696
——Tiger-bites and their treatment 256
Khasi village, The spread of dysentery in a, and its treatment with bacteriophage (Chowdhury and Morison) (O. A.) .. 66
King-Emperor, The illness of H. M. (E.) 151
Kohler, A. Rontgenology .. 111
Krishnamurty, C. H. A case of diagnosis .. 299
——A case for diagnosis .. 478
——A case of typhoid fever, relapse, toxæmic collapse and recovery 259
——Dysentery in the Central jail, Rajamandry .. 679
Kulkarni, N. W. *see* Vad B. G. Malaria therapy in tabes dorsalis .. 684
——N. W. *see* Vad, B. G. A modified Sippy's line of treatment in duodenal ulcer 196
——N. W. *see* Vad, B. G. Observations on the excretion of alcohol in the cerebro-spinal fluid and urine after oral administration 500
Kurchi bismuthous iodide, its value in the treatment of chronic amœbic infections of the bowel (Acton and Chopra) (O. A.) .. 481
Kutumbia, P. *see* Kamath, M. L. A case of Hysteria .. 87
——P. *see* Kamath, M. L. A case of Acholuric jaundice .. 26

L

Labernadie, V. G. F. *see* Borel, E. A list of the species of mosquitoes collected in the French Settlements in India .. 495
——V. and Zeganadi, A. The successful use of a tuberculous methylic antigen in external tuberculosis .. 691
Labour, Difficult (C. T.) .. 647
——sedatives in, particularly "Twilight sleep" (C. T.) 590
Lahiri, K. P. A further note on the action of hæmoplastin .. 256
Lake, R. and Peters, E. A. Handbook of Diseases of the Ear for Students and Practitioners .. 42
Lal, S. The treatment of acute vaginismus 479

Page

Lall, P. A. S. *see* Stott, H. A further case of diaphysial aclasis with a marked family history .. 258
——R. *see* Stott, H. Seven cases of diaphysial aclasis in Indians, including four cases from one family .. 9
Lalvani, P. P. Electro-coagulation (surgical diathermy) in multiple angiomata of the head 387
Landeman, E. The treatment of Myiasis in lepers .. 657
Landry's paralysis, A case of acute ascending (Viswanathan) (H. P.) 328
Larvicide, Experiments with isotex as a (Feegrade) (O. A.) .. 252
——Results of experiments with crude oil products of the Burma Oil Co., Ltd., Rangoon (Feegrade) (O. A.) .. 255
Latey, S. G. *see* Gharpure, P. V. An enquiry into the physical conditions of Indian labour .. 673
League of Nations and opium (C. T.) 42
Leishmanias, various, Culture and differential diagnosis of the, on solid culture-medium (C. T.) 35
Leitch, J. N. Tropical dietaries 658
Lennox, W. G. and Cobb, S. Medicine Monographs. Volume XIV, Epilepsy .. 284
Lepers, Myiasis in (Rao) (O. A.) 380
——The treatment of Myiasis in (Landeman) (C.) .. 657
Leprosy, The Campaign against (Muir) (S. A.) .. 92
——and dermal leishmaniasis, combined, three cases of (Napier and Henderson) (H. P.) 446
——early, An obscure neurological case simulating (Muir and Henderson) (H. P.) 386
——The erythrocyte sedimentation test in (Muir) (O. A.) 488
——in India (M. N.) .. 516
——The infectiousness of (Muir) (O. A.) .. 620
——in Manipur State (Crozier) (O. A.) 315
——Nerve abscess in (Lowe) (H. P.) 24
——Notes on some hæmatological and serological investigations in (C. T.) 462
——Notes on the value of the sedimentation test in the treatment of (Kerr) (O. A.) 247
——successfully treated, Two cases of (Mohanty) (H. P.) 694
——The use of fibrolysin in (Figueredo) (O. A.) .. 426
Leprous reaction (Lowe) (O. A.) 438
Leucocyte counts, Value of, according to Schilling formula, in clinical medicine (C. T.) .. 464
Leucoma, Tatooing of the cornea with platinum chloride solution for (Banaji) (O. A.) .. 201
Life insurance, Standardised lives and their assessment in (Cursetji) (C.) .. 538
Light and heat in therapy (with a chapter on foam treatment) .. 530
Lipiodol, Investigation of pulmonary conditions with (C. T.) 702
Lister, H. Aids to Zoology .. 709
Liver diet in young convalescents, A note on blood changes associated with (C. T.) .. 30

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Liver, function, The Bromsulphalein test of (C. T.) .. 30
———Night-blindness and its speedy cure with liver (Bouche) (C.) .. 178
———preliminary note on the after-results of treatment with: Pernicious Anæmia (C. T.) 645
———Radiological examination of the, in cases of suspected amœbic abscess (Barrett) (O. A.) 375
———The treatment of pernicious anæmia by (C. T.) .. 647
Livingstone, J. L. Aids to Medicine 349
Lloyd, R. B. Blood tests in relation to blood transfusion .. 121
———R. B. and Chandra, S. N. Dangerous blood donors .. 361
Lobar pneumonia with intermittent temperature (Chakrabatty) (C.) 477
London School of Hygiene and Tropical Medicine. Examination Result. 85th Term (M. N.) .. 273
———School of Hygiene and Tropical Medicine. Examination Result. 86th Term (M. N.) .. 577
———School of Hygiene and Tropical Medicine (M. N.) 636
Lord, J. R. Edited by Contributions to Psychiatry, Neurology and Sociology 529
Lowe, J. Leprous reaction .. 438
———Nerve abscess in leprosy 24
Lungs, The vital capacity of the (Bhatia) (S. A.) 519
Lusk, G. The elements of the science of Nutrition .. 704
Lymphangitis, Filarial (Menon) (C.) 658
———Filarial, The importance of secondary infections in the causation of (Acton and Rao) (O. A.) .. 421
Lyon's Medical Jurisprudence for India with Illustrative Cases. By L. A. Waddell .. 44

M

M.Ds, Bogus (Karnik) (C.) .. 717
MacCallum, W. G. A Textbook of Pathology 288
Mackenzie, J. Army Health in India, Hygiene and Pathology Reviews (Oct. 1929) .. 596
Mackey, G. and Jolly, G. G. Observations on a series of bacteriological examinations of tube well water in Rangoon .. 624
Mackie, F. P. Malignant anæmia of the tropics 305
Madarihat and its environs, A malaria survey of (Sur and Ghosh) (O. A.) .. 558
Madras Presidency, Dysentery in the Central jail, Rajamandry (Krishnamurty) (O. A.) .. 679
Mahadevia, C. G. Sudden deaths in young females .. 297
Majumdar, A. R. Modern Pharmacology and Therapeutic Guide 531
Malaria, B. T., quinine troposan in the treatment of chronic (C. T.) .. 99
———B. T., Treatment of chronic, with Smalarina Cremonese (C. T.) .. 100
———control at Birnagar (Bose) (S. A.) .. 323
———control, A new suggestion in (E.) .. 697

Page

Malaria, on a group of tea estates, Microscopic diagnosis of (Murphy) (O. A.) .. 557
———in Kandi sub-division of Murshidabad district in 1928, Epidemic jaundice (Weil's disease) or (Sur and Sarkar) (O. A.) .. 619
———Notes on the detection in the urine of some drugs used for the treatment of (Green) (O. A.) .. 614
———The parasitology of: An appeal for information (E.) 452
———parasitology of Indian: unpublished information (Knowles) (E.) .. 573
———Plasmochin in (C. T.) .. 275
———Plasmochin compositum in the treatment of (Karamchandni) (O. A.) 626
———quartan, The treatment of with plasmochin (C. T.) 527
———A review of, during 1928 in a minor hill station in the Punjab (Irvine) (O. A.) 307
———in the Sibsagar district, Assam, Notes on (Sen Gupta) (O. A.) .. 681
———Studies in, with special reference to treatment (C. T.) 278
———studies on, with special reference to treatment with plasmoquine (C. T.) 37
———survey of Madarihat and its environs (Sur and Ghosh) (O. A.) .. 558
———Temporary insanity following an attack of (Sen Gupta) (H. P.) .. 507
———therapy in tabes dorsalis (Vad and Kulkarni) (O. A.) 684
Malarial cases in the Bengal Nagpur Railway construction Hospital, Titlagarh, from July 1928 to August 1929, with some observations on mosquito findings and conditions of transmission (Speedy and Adhikari) (O. A.) 629
———parasites, The fate of the merozoites seen in the cultures of (Row) (O. A.) 142
———work anti, Notes for staff engaged on (Speedy) (O. A.) 249
Mallannah, A. A suggestion for improvement in the dietary of the Indian community to secure a higher degree of health and efficiency .. 199
———S. A vaccine for the treatment of phthisical patients who expectorate tubercle bacilli in the sputum 198
Manipur State, Leprosy in (Crozier) (O. A.) .. 315
Mankad, M. B. Ascaris infection simulating Bright's disease .. 357
Manson-Bahr, P. H. Manson's Tropical Diseases: A manual of the diseases of warm climate .. 468
Maplestone, P. A. A case of human infection with a gnathostome in India 610
———P. A. The species distribution of hookworms in India .. 371

Page

Maplestone, P. A. and Mukerji, A. K. Tetrachlorethylene in the treatment of hookworm disease 424
Marriot, W. McKim. Recent Advances in Chemistry in Relation to Medical Practice .. 50
Martindale, W. H. The Extra Pharmacœpia of Martindale and Westcott. Vol. I, 1928 .. 48
Maternal mortality in India: A preliminary study (Ubhaya, Adiseshan) (O. A.) .. 550
Maxwell, J. L. The diseases of China (including Formosa and Korea) 468
Mayneford, W. V. The physics of x-ray therapy .. 530
Medical Annual, 1929 .. 467
———Council in India (E.) .. 27
———Policy in India (C. T.) 337
———Research in 1928 (C. T.) 467
———Research, The Idea and the method in (C. T.) .. 160
———Science in India (Roy) (C.) 414
———Science in India, The present position of (Gill) (S. A.) 152
———and Surgical Dossier or patient's case-sheet (C. T.) 228
Medicine: Vol. VII, No. I, February and No. II, May, 1928 .. 46
Medico-legal interest, A case of (Umar) (H. P.) 255
Megaw, J. W. D. The Yellow fever danger .. 354
———J. W. D. and Hawley, H. Simple tests for stock solutions of quinine and potassium iodide .. 378
Melaena and Hæmatemesis in the new born (Saha) (C.) 356
———and hæmatemesis in a newly-born baby (Sen Gupta) (S. C.) .. 25
Meningitis, A case of syphilitic basal (Pai) (H. P.) .. 89
Menon, T. B. Filarial lymphangitis 658
Mense, C. Handbuch Der Tropenkrankheiten. Vol. V .. 653
Menstrual bleeding, A study of the use of parathormone in the control of (C. T.) .. 466
Mental, Hygiene, in India (Pacheco) (C.) .. 356
Merozoites seen in the cultures of malarial parasites, The fate of the (Row) (O. A.) .. 142
Methylic antigen, tuberculous, The successful use of a, in external tuberculosis (Labernadie) (O. A.) 691
Mice, coat effect observed in, when fed with fats under certain conditions (Boyd and Roy) (O. A.) 564
Microscopical changes occurring in organs after death (C. T.) 463
Mitra, S. On the rationale of treatment of carcinoma of the cervix uteri 316
Mitter, A. K. *see* Ghose, D. N. A case of inguinal hernia with a fæcal tumour in the scrotum 208
Modi, J. P. Elements of Hygiene and Public Health .. 530
Montagu, J. F. Taking the doctor's pulse, and another essay .. 166
Mody, N. C. *see* Hance, J. B. and Ujwal, S. D. Notes on the new conceptions of sciatic pain and on its treatment .. 541
Mohanty, L. N. Two cases of leprosy successfully treated .. 694

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Morison, J. *see* Pal Choudhury, B. K. The spread of dysentery in a Khasi village and its treatment with bacteriophage .. 66
Morton, R. A. Radiation in Chemistry 48
Mosquitoes, A list of the species of, collected in the French settlements in India (Borel and Labernadie) 495
Mount Everest, The problem of (C. T.) 31
Moxon, H. W. A Patient's Manual of Diabetes .. 290
Moynihan, B. Addresses on Surgical Subjects 45
Mudaliar, A. L. The Causes of Ante-Natal, Natal and Neo-Natal Mortality of Infants .. 43
———K. S. A. A case of aphasia during spinal anæsthesia .. 695
Muir, E. The Campaign against leprosy .. 92
———The erythrocyte sedimentation test in leprosy .. 488
———The infectiousness of leprosy .. 620
———and Henderson, J. M. An obscure neurological case simulating early leprosy .. 386
Mukherjee, A. K. Kala-azar chikitsa (in Bengali) 109
———H. N. Estimation of blood sugar .. 118
———H. N. A simple method for the estimation of blood urea applicable at the bed-side .. 252
———N. K. Blood pressure in Indians .. 598
———R. K. *see* Sinha, D. N. A case of bleeding from the breast .. 149
———U. P. A case for diagnosis .. 717
Mukerji, A. Isolation of the antineuritic vitamin .. 443
———S. The carnivorous habits of Indian "blood-worms" 323
———S. The treatment of vaginismus .. 718
———A. K. *see* Maplestone, P. A. Tetrachlorethylene in the treatment of hook-worm disease .. 424
Mullick, M. N. *see* Napier, L. E. The intensive treatment of kala-azar by neostibosan; Part II .. 314
Multan district, Goitre in (Chaudhuri) (O. A.) .. 492
Multiple exostosis in Indians, etc. (Stott and Lall) (O. A.) .. 9
Murphy, R. A. Microscopic diagnosis of malaria on a group of tea estates .. 557
Musculo-spiral nerve paralysis following an intramuscular injection of quinine (Seshachalam) (H. P.) 86
Museum making, A note on (Gharpure) (O. A.) .. 678
Myiasis of a carious tooth, A case of (Strickland) (H. P.) 386
———in lepers (Rao) (O. A.) 380
———in lepers, The treatment of (Landeman) (C.) .. 657
McCarrison, R. Food .. 291
McClanaham, H. M. Pediatrics for the General Practitioner .. 708
McDougall, J. B. Percussion of the Chest 594
McGuigan, H. A. A Textbook of Pharmacology and Therapeutics 652

Page

McGuire, G. Hints on the village nurse scheme .. 95
———C. *see* Acton, H. W. "Cooly" Itch. A purulent folliculitis due to the trichophyton violaceum variety indicum .. 241
McKendree, C. A. Neurological Examination 470
McRitchie, P. A benign spinal tumour 328
McRobert, G. R. William Harvey's message to India .. 225
McSwiney, S. A. Cæsarean section. Some types and their uses 5

N

Nag, S. C. Alastrim or Small-pox 90
———Notes on the use of carbon tetrachloride .. 683
———Retention of urine in blackwater fever .. 505
Naga Sore, The ætiology of (Smith) (C.) .. 239
———sores in Gwalior (Khandehar) (H. P.) .. 696
Nanavatty, B. H. A chronic encysted mammary abscess simulating scirrhous cancer .. 632
Nande, D. Diphtheria in India 117
Nanhorya, H. B. D. Analysis of a hundred cases of cataract extraction at the Raipur Main Hospital by Smith's method with a flap of conjunctiva .. 193
Napier, L. E. Notes on "The significance of the antimony test in the diagnosis of kala-azar .. 669
———and Haldar, K. C. A case of induced poly-leucocythæmia 382
———and Henderson, J. M. Three cases of combined leprosy and dermal leishmaniasis .. 446
———and Mullick, M. N. The intensive treatment of kala-azar by neostibosan; Part II .. 314
Narcosis, Avertin rectal (Poduval) (O. A.) 432
Nasal obstruction (C. T.) .. 29
Nath, C. A huge ovarian cyst .. 257
Neosalvarsan (Havero Trading Co., Ltd.) (C.) .. 357
———injections, A case of exfoliative dermatitis after (Dave) (H. P.) .. 209
Neostibosan, The intensive treatment of kala-azar by, Part II (Napier and Mullick) (O. A.) 314
Nephritis, Some modern aspects of (C. T.) 521
Nerve abscess in Leprosy (Lowe) (H. P.) 24
———paralysis, Musculo-spiral, following an intramuscular injection of quinine (Seshachalam) (H. P.) .. 86
Nervous manifestations in tuberculous infections (Gharpure) (O. A.) 565
Neurasthenia, Treatment of (C. T.) 467
Neurological case, An obscure, simulating early leprosy (Muir and Henderson) (H. P.) .. 386
Newborn, Silver nitrate in the eye of the (C. T.) 231
Newsholme, Sir Arthur. The story of Modern Preventive Medicine 469

Page

Nigam, K. S. Preventive Surgery 355
Night blindness and its speedy cure with liver (Bouche) (C.) .. 178
———The treatment of (Varma) (C.) .. 356
Nordhoff Jung Cancer Prize (M. N.) 336
Noronha, F. Post encephalitic Parkinsonism 21
Norrie, F. H. B. A case of "Glandular fever" .. 328
Norris, G. W., Bazett, H. C. and McMillan, T. M. Blood-pressure: its clinical application .. 164
Notification of dangerous diseases (E.) 211
Novasurol and Ammonium Chloride, Treatment of ascites by (C. T.) 229

O

O'Meara, E. I. Medical Guide for India and Index of Treatment 653
Obstetrics and Gynæcology, during 1928, Some reflections on (Green-Armytage) (S. A.) .. 261
Œsophagus, A case of diverticulum of the (Torpy) (H. P.) 511
Office International d'Hygiene Publique, The October 1928, session of the (M. N.) .. 516
Oils, Subcutaneous injection of, or oily preparations (DaCosta) (C.) 297
Oldfield, C. Herman's difficult labour: a guide for students and practitioners. 711
Omar, M. A. Intravenous iodine 414
Ophthalmic emergencies in general practice, Some (C. T.) .. 456
Ophthalmological notes (C. T.) .. 280
———notes (C. T.) .. 401
———Society, All-India (M. N.) .. 393
Ophthalmology, The Sixth Post-graduate course in, Vienna, 1929 (M. N.) .. 336
———in relation to research (Wright) (S. A.) .. 217
Opium, The League of Nations and (C. T.) 42
Oppenheimer, H. Medical and Allied Topics in Latin Poetry 290
Oriental sore, Berberine sulphate in (Devi) (O. A.) 139
———Berberine in the treatment of (Das Gupta and Dikshita) (O. A.) .. 67
———A Persian treatment for (Vatchaghandy) (H. P.) .. 572
Osler, Sir William. Edited by Modern Medicine .. 289
Ossin, H. C. Fascial Grafting in Principle and Practice .. 285
Ovarian cyst, A huge (Chhagan Nath) (H. P.) .. 257
———therapy (C. T.) .. 592
Oxytocin, Vasopressin and, A preliminary note on the action of (David and Vareed) (O. A.) 73

P

Pacheco, J. N. Mental Hygiene in India .. 356
———Pathological laughing and crying .. 561
———The treatment of acute vaginismus 478

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Pai, M. K. A comparative study of the effect of climate and of the seasons on body weight in pulmonary tuberculosis in different countries .. 496
——M. N. A case of syphilitic basal meningitis .. 89
Pal Choudhury, B. K. and Morison, J. The spread of dysentery in a Khasi village and its treatment with bacteriophage 66
——M. S. Treatment of gonorrhœa 178
Palfrey, F. W. The facts of modern medicine .. 594
Paralysis (Landry's?), A case of acute ascending (Viswanathan) (H. P.) 328
Paranjpe, A. S. A note on the action of synthetic adrenaline .. 688
Parasitology of Indian malaria:
————unpublished information (Knowles) (E.) .. 573
————Malaria: An appeal for information (E.) .. 452
Parathormone in the control of menstrual bleeding (C. T.) .. 466
Paris green as an anopheline larvicide (Sur and Sarkar) (O. A.) 376
Parmanand, M. J. A note on spirillum minus, the causative organism of rat-bite fever .. 190
Patella, fractured, Notes on (C. T.) 641
————Unusual displacements of the epiphysis of the (Barrett) (O. A.) .. 445
Paterson, H. G. Indigestion: its differential Diagnosis and Treatment 707
Pathological laughing and crying (Pacheco) (O. A.) .. 561
Patient's Case Sheet, The Medical and surgical dossier or (C. T.) 228
Pelonze, P. S. Gonococcal Urethritis in the male: for practitioners 351
Pereira, C. R. and D'Cruz, J. M. A case of Hyperpyrexia for diagnosis .. 260
————J. M. A district scheme for cholera control .. 455
Peritoneal cavity, A case of free bile in the (Siddiqi) (H. P.) .. 385
————forceps (Webb) (C.) 657
Pernicious anæmia in the light of the newer knowledge, Impressions of the nature of (C. T.) .. 102
————anæmia: preliminary note on the after-results of treatment with liver (C. T.) .. 645
————anæmia, The treatment of, by liver (C. T.) .. 647
Persian treatment for oriental sore (Vatchaghandy) (H. P.) 572
Perthe's disease (Ghosh) (O. A.) 441
Phthisical patients who expectorate tubercle bacilli in the sputum, A vaccine for the treatment of (Mallannah) (O. A.) .. 198
Pilai, K. V. *see* Dikshit, B. B. and Chopra, R. N. A preliminary note on the action and uses of pseudo-ephedrine .. 1
Pillai, M. D. A case for Diagnosis 118
Pillay, A. P. and Subramanyam, M. Maternity and Child-Welfare 287
Pincy, A. Diseases of the blood 109
Pituitrin, Intravenous (Guha) (C.) 414
————The intravenous use of (Bhattacharya) (C.) .. 239
Plague, A suggested measure in the control of (Gama) (C.) .. 599

Page

Plasmochin compositum in the treatment of malaria (Karamchandani) (O. A.) 626
————in malaria (C. T.) .. 275
Plasmodium vivax, Cerebral symptoms caused by (Das Gupta) (H. P.) .. 507
Plasmoquine (Wade) (C.) .. 58
————compound, The treatment of "Crescent carriers" with (C. T.) 527
————in pregnancy (Thakkar) (O. A.) 198
————in the treatment of malaria, etc. (C. T.) .. 37
————The treatment of quartan malaria with (C. T.) 527
Platinum chloride solution for leucoma, Tattooing of the cornea with (Banaji) (O. A.) .. 201
Pneumococcus immunogen combined in the treatment of pneumonia, The use of (Bhaduri) (O. A.) 301
————immunogen, The use of, combined in the treatment of (D'Abreu) (C.) 538
Pneumonia, Apyrexial (Iyer, U. A. K.) (H. P.) .. 207
————The use of pneumococcus immunogen combined in the treatment of (D'Abreu) (C.) .. 538
————The use of pneumococcus immunogen combined in the treatment of pneumonia (Bhaduri) (O. A.) .. 301
Poduval, A. R. Avertin in rectal narcosis 432
Poisoning with barium sulphide, A case of accidental (Singh) (H. P.) 506
Poly-leucocythæmia, A case of induced (Napier and Halder) (H. P.) 382
Population, The problem of (E.) 91
Post-encephalitic Parkinsonism (Noronha, F.) (H. P.) .. 21
Post-Graduate Courses, International Medical, in Berlin (M. N.) 453
Post-kala-azar Dermal Leishmaniasis, A case of (Dey) (H. P.) 147
Potassium Iodide, Simple tests for stock solutions of quinine and (Megaw and Hawley) (O. A.) 378
Pottenger, F. M. Tuberculosis and How to combat it: A book for the patient .. 471
Power, H. D. Principles of Pathology for practitioners and students 710
Practical notes (C. T.) .. 396
Pradhan, D. V. A case of irreducible hernia relieved by atropine sulphate .. 692
Prasad, R. Accidental suffocation in a well 298
Pregnancy, A new test for (C. T.) 158
————Plasmoquin in (Thakkar) (O. A.) .. 198
————toxæmia, An interesting case of recurrent (Bose) (H. P.) .. 202
Preventive medicine and public health, Proposals for next steps in (C. T.) 163
————surgery (Nigam) (C.) 355
Proctor, A. H. The continuous administration of saline per rectum 4
Professional etiquette (C. T.) .. 280
Pruitt, M. C. Injection treatment of internal Hæmorrhoids .. 595

Page

Pruritus ani and anal fissure; Treatment of, the use of anæsthetic solutions in oil (C. T.) .. 645
Pseudo-ephedrine, A preliminary note on the action and uses of (Chopra, R. N., Dikshit, B. B., Pillai, K. V.) (O. A.) .. 1
Pseudo-Pregnancy, A case of (Sharma) (H. P.) .. 330
Public health, Proposals for next steps in preventive medicine and (C. T.) 163
Puerperal morbidity treated in the Rotunda Hospital, Dublin, An analysis of 675 cases of (Dutta) (O. A.) 435
Punjab, A review of malaria during 1928 in a minor hill station in the (Irvine) (O. A.) 307
Pyorrhœa alveolaris (C. T.) .. 397

Q

Quinine abscesses (Husain) (H. P.) 330
————A case of intolerance to (Gandhi) (C.) .. 659
————injection, A radical cure for hydrocele by (Sharma) (H. P.) .. 571
————an intramuscular injection of, Musculo-spiral nerve paralysis following (Seshachalam) (H. P.) 86
————intravenous .. 275
————Simple tests for stock solutions of and potassium iodide (Megaw and Hawley) (O. A.) .. 378
————troposan in the treatment of chronic B. T. malaria (C. T.) .. 99
Quiyum, Md. A. A case of elephantiasis cured by arrhenol 450

R

Radiological examination of the liver in cases of suspected amœbic abscess (Barrett) (O. A.) 375
Radiology in the diagnosis of chronic appendicitis (Barrett) (O. A.) .. 129
————and electrology, Cambridge University Diploma in Medical (M. N.) .. 215
Rambo, V. C. A case of amyotrophic lateral sclerosis in an East Indian .. 22
————The response of a group of Indian infants and children to the Schick test, etc. .. 145
Ranchi Indian Mental Hospital, treated at the, Encephalitis lethargica, etc. (Dhunjibhoy) (O. A.) 362
Rangoon, Epidemic Dropsy in, in the year 1924 (Dalal, K. R.) (O. A.) .. 19
————Kata-thermometer readings at, A year's record of (Jolly and Fenn) (O. A.) 319
————Observations on a series of bacteriological examinations of tube well water in Rangoon (Mackey and Jolly) (O. A.) 624
Rao, G. R. Myiasis in Lepers .. 380
——S. S. The history of tick-bites in cases of tick-typhus in India 76

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Rao, S. S. Occurrence of Chyluria after confinement .. 87
——S. S. *see* Acton, H. W. A case of filarial abscess .. 631
——S. S. *see* Acton, H. W. The importance of secondary infections in the causation of filarial lymphangitis .. 421
——S. S. *see* Acton, H. W. "Kataphylaxia." A phenomenon seen clinically in filariasis 601
——S. S. *see* Chopra, R. N. Studies in the treatment of filariasis 130
Rat-bite fever, A case of (Iyer) (H. P.) .. 571
——A note on spirillum minus, the causative organism of (Paramanand) (O. A.) .. 190
Rat trap, A simple (Stocker) (C.) 297
Ray, K. S. Prevention of dangerous diseases Act, 1928 .. 211
Raynaud's disease, A case of (Bajpayee) (H. P.) .. 692
Rectal narcosis, Avertin (Poduval) (O. A.) 432
Rectum, The continuous administration of saline per (Proctor) (O. A.) 4
Refractometry in clinical research, The importance of (Rostock) (S. A.) 578
Rehberger, G. E. Lippincott's Pocket Formulary .. 472
Reinhold, C. H. and Greenway, L. A. N. Some cases of *B. coli* baciluria 503
Renal disease, The value of modern tests in (C. T.) .. 342
——therapeutics (C. T.) .. 275
Retina, Detachment of the (Anklesaria) (O. A.) .. 186
Riddell, L. Medico-legal problems 595
Rivers, T. M. Edited by Filterable Viruses. By various authors 46
Rodent ulcer, Early, The treatment of (C. T.) .. 35
Roehl, W. Chemotherapeutic investigations with antimony preparations in the experimental kala-azar of the hamster .. 563
Rogers, Sir L. Recent Advances in Tropical Medicine .. 651
Rolleston, Sir Humphry. Aspects of age, life, and disease .. 282
Rosewarne, D. D. The science of nutrition simplified: A popular introduction to dietetics .. 704
Ross Institute, The industrial antimalarial advisory committee of the (M. N.) .. 638
——*Sir Ronald. Studies on Malaria* 233
——*Sir Ronald. Une Grande Page de L'Histoire de La Me'dicine: La Decouverte de la transmission du Paludisme par les Moustiques* .. 234
Rostock, P. The importance of refractometry in clinical research 578
Roundworm infection simulating appendicitis (Sukhavanam) (H. P.) 261
Row, R. The fate of the merozoites seen in the cultures of malarial parasites .. 142
Roy, A. C. *see* Boyd, T. C. A coat effect observed in mice when fed with fats under certain conditions .. 564
——A. C. *see* Boyd, T. C. A preliminary note on a colour reaction for "693" and its application in the estimation of that compound in the urine 382

Page

Roy, A. T. Medical Science in India 414
——J. D. A case of acute vaginismus 298
——J. D. The sterilization of syringes 297
——M. B. *see* Chatterji, D. N. The valuation of charas .. 373
Royal Institute of Public Health, London (M. N.) .. 640
Royster, H. A. Appendicitis .. 167
Rubber catheter inside the bladder, A case of (Dutt Gupta) (H. P.) 210
Russell, E. H. and Russell, W. K. Ultra-violet radiation and Actinotherapy 529

S

S. P. Gonorrhœa and its treatment with acriflavine .. 716
Saha, A. Melæna and Hæmatemesis in the new born .. 356
——The treatment of seasickness .. 498
Sahasrabudhe, N. S. An Introduction to Anatomy .. 530
Saline per rectum, The continuous administration of (Proctor, A. H.) (O. A.) 4
Salvarsan treatment, Uncommon ill effects of (C. T.) .. 105
Salyrgan: A mercuric diuretic. New remedial agents (C. T.) .. 399
Sanocrysin investigation, The report on (C. T.) .. 39
Sarbadhikari, S. P. A case for diagnosis 478
Sarkar, H. *see* Sur, S. N. Epidemic jaundice (Weil's disease) or malaria in Kandi subdivision of Murshidabad district in 1928 619
——H. *see* Sur, S. N. Paris green as an anopheline larvicide 376
——K. P. and Sircar, P. B. Intravenous iodine in ulcus tropicum .. 658
——K. P. and Sircar, P. B. The sterilization of hypodermic syringes .. 718
——P. B. *see* Sarkar, K. P. Intravenous iodine in ulcus tropicum .. 658
Schamberg, J. F. and Kolmer, J. A. Acute infectious diseases 348
Schick test, The response of a group of Indian infants and children to the (Rambo) (O. A.) 145
Schilling formula in clinical medicine, Value of leucocyte counts, according to (C. T.) .. 464
Sciatic pain and its treatment, New conceptions of (Galstaun) (C.) .. 717
——and on its treatment, Notes on the new conceptions of (Hance, Mody and Ujwal) (O. A.) .. 541
Scientific Reports from the Government Institute for Infectious Diseases, Tokyo. Vol. VI, 1927 45
Sclerosis, A case of amyotrophic lateral, in an East Indian (Rambo, V. C.) (H. P.) .. 22
Scrotum, A case of inguinal hernia with a fæcal tumour in the (Ghose and Mitter) (H. P.) .. 208
Sea sickness, The treatment of (Saha) (O. A.) .. 498
Sedimentation test in the treatment of leprosy, Notes on the value of the (Kerr) (O. A.) .. 247

Page

Sen Gupta, J. M. Notes on malaria in the Sibsagar district, Assam 681
——S. C. An interesting case of melæna and hæmatemesis in a newly born baby .. 25
——S. C. Temporary insanity following an attack of malaria .. 507
Seshachalam, T. *see* Albuquerque, M. C. Notes on a case of human hermaphrodite .. 509
——T. Musculo-spiral nerve paralysis following an intramuscular injection of quinine .. 86
Sexual Reform, The third international congress of the world league (M. N.) .. 393
Sharma, B. L. A radical cure for hydrocele by quinine injection .. 571
——C. S. The sterilization of hypodermic syringes 477
——P. A case of pseudo-pregnancy .. 330
Sharpe, W. and Sharpe, N. Neuro-Surgery 473
Shoung, Ah. *see* DaCosta, J. J. G. and Jolly, G. The value of preventive inoculation against cholera 618
Sibsagar District, Assam, Notes on malaria in the (Sen Gupta) (O. A.) 681
Siddiqi, A. H. A case of free bile in the peritoneal cavity .. 385
Silver nitrate in the eye of the newborn (C. T.) .. 231
Singh, B. A case of accidental poisoning with barium sulphide 506
——G. B. Sterilization of hypodermic syringe .. 659
——R. Undescended testis as a cause of physical rejection 598
Sinha, D. N. and Mukherjee, R. K. A case of bleeding from the breast 149
Sippy's line of treatment in duodenal ulcer, A modified (Vad and Kulkarni) (O. A.) .. 196
Sircar, P. B. *see* Sarkar, K. P. The sterilization of hypodermic syringes .. 718
——T. Vomiting of "Bees" 598
Sleep in the treatment of acute disease (C. T.) .. 398
Smalarina Cremonese, The treatment of chronic B. T. malaria with (C. T.) 100
Small-Pox, Alastrim or (Nag) (H. P.) 90
Smith, F. J. London Hospital lectures on Forensic Medicine and Toxicology 403
——H. S. The Ætiology of Naga Sore .. 239
Smith's method, Analysis of hundred cases of cataract extraction at the Raipur Main Hospital, with a flap of conjunctiva (Nanhorya) (O. A.) 193
Snakes, Breath sucker (Dutt) (O. A.) 201
Social Hygiene Congress, 1929, Fourth Imperial (M. N.) .. 215
Sodium bicarbonate, The treatment of blackwater fever by oral (C. T.) 592
Sollmann, T. and Hanzlik, P. J. An Introduction to Experimental Pharmacology 47
Speed, K. A textbook of fractures and dislocations .. 705

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Speedy, W. D. Notes for staff engaged on anti-malarial work 249
———W. D. and Adhikari, A. K. A record of malarial cases in the Bengal-Nagpur Railway Construction Hospital, Titlagarh, from July 1928 to August 1929, with some observations on mosquito findings and conditions of transmission 629
Spinal tumour, A benign (Ritchie) (H. P.) 328
Spirillum minus (Carter), the causative organism of rat-bite fever, A note on (Paramanand) (O. A.) .. 190
Spittel, R. L. An improvised drop regulator 192
Spleen, The (Bhatia) (S. A.) .. 453
———Some aspects of the surgery of the (C. T.) .. 394
Splenomegaly in childhood, Observations on chronic: Diagnosis and treatment (C. T.) .. 155
Splinting, An efficient and economical method of: Colles's fracture (C. T.) 528
Sprue, The morbid anatomy of (C. T.) 401
Sputum, A vaccine for the treatment of phthisical patients who expectorate tubercle bacilli in the (Mallannah) (O. A.) .. 198
Stander, H. J. Toxæmias of pregnancy 710
Staphylococcal septicæmia, A case of (Bagchi) (H. P.) .. 508
Stephens, G. A. Auricular fibrillation after aspirin .. 178
Sterilization of hypodermic syringes (Sarkar) (C.) .. 718
———of hypodermic syringes (Sharma) (C.) .. 477
———of hypodermic syringes (Subbiah) (C.) .. 478
———of hypodermic syringe (Singh) (C.) .. 659
Sternberg, W. Technique and Method of use of Sternberg's Gastroscopy and Gastroscopic treatment 472
Stitt, E. R. The diagnostics and treatment of Tropical diseases .. 406
Stocker, C. J. A simple rat trap 297
Stott, H. and Lall, P. A. S. A further case of diaphysial aclasis with a marked family history .. 258
———H. and Lall, R. Seven cases of diaphysial aclasis in Indians including four cases from one family .. 9
Strickland, C. A case of Myiasis of a carious tooth .. 386
Subbiah, M. Sterilization of hypodermic syringes .. 478
Subcutaneous injection of oils or oily preparations (DaCosta) (C.) 297
Suffocation in a well, accidental (Prasad) (C.) .. 298
———in a well, A case of accidental (Henriques) (H. P.) 570
Sukhavanam, B. A case of suppression of urine .. 261
———B. Roundworm infection simulating appendicitis .. 261
Suprapubis Cystotomy, The indication for (Ghosh) (O. A.) .. 687
Sur, S. N. and Ghosh, B. A malaria survey of Madarihat and its environs .. 558
Sur, S. N. and Sarkar, H. Epidemic jaundice (Weil's disease) or malaria in Kandi sub-division of Murshidabad district in 1928 .. 619
———S. N. and Sarkar, H. Paris green as an anopheline larvicide 376
Surgical cases of interest (Husain) (H. P.) 85
Survey of Medical Missions in India, 1929 593
Swimming baths (C. T.) .. 279
Symes, J. O. Erythema Nodosum 107
Synovial and serous affections, Iodised tincture of guaiacol in the treatment of (C. T.) .. 395
Syphilis, Gastric (Bradfield and Vasudevan) (O. A.) .. 125
Syphilitic basal meningitis, A case of (Pai) (H. P.) .. 89
Syphilology, dermatology and, The eighth international congress of (M. N.) 578
Syringes, The sterilization of (Roy) (C.) 297

T

T. A. B. Vaccine in relation to an outbreak of enteric fevers (Afridi) (O. A.) 670
Tabes dorsalis in an Indian (Yusuf) (H. P.) .. 448
———Dorsalis, Malaria Therapy in (Vad and Kulkarni) (O. A.) 684
Tannic acid, The treatment of burns and scalds by (C. T.) .. 341
Tatooing of the cornea with platinum chloride solution for leucoma (Banaji) (O. A.) .. 201
Terminala Arjuna: Its chemistry, pharmacology and therapeutic action (Chopra and Ghosh) (O. A.) 70
Testicle, An undescended, in an unusual position (Christian) (O. A.) 87
Testicular pain (C. T.) .. 343
Testis, undescended, as a cause of physical rejection (Singh) (C.) 598
Tetanus, Cephalic, A case of (Bagchi) (H. P.) .. 89
Tetrachlorethylene in the treatment of hookworm disease (Maplestone and Mukerji) (O. A.) 424
Tetronal, The effect of, on the production of hæmatoporphyrin in the urine (Germuth) (O. A.) 491
Thakkar, K. V. Plasmoquin in pregnancy 198
Therapeutic notes (C. T.) .. 399
———Substances Act for India, The need for a (E.) 389
Thomson, J. G. Protozoology, A Manual for Medical Men .. 344
Thornhill, R. Varicose veins .. 165
Tick-bites in cases of tick-typhus in India, The history of (Sundar Rao) (O. A.) .. 76
Tick-typhus in India, The history of tick-bites in cases of (Sundar Rao) (O. A.) .. 77
Tidy, H. L. Edited by an Index of Symptomatology by various writers 291
Tiger-bites and their treatment (Khandekar) (H. P.) .. 256
Tincture of Guaiacol, Iodised, in the treatment of synovial and serous affections (C. T.) .. 395
Tindal, D. Gleanings from General Practice 350
Tomb, J. W. A note on the value of medicinal treatment in cholera 246
Tooth, carious, A case of myiasis of a (Strickland) (H. P.) .. 386
Torpy, C. D. A case of diverticulum of the œsophagus .. 511
Trachoma, Chaulmoogra oil in the treatment of (Gubbay) (O. A.) 563
Trease, G. E. Aids to Pharmaceutical Latin .. 653
Tregold, A. F. Mental deficiency (Amentia) 528
Tropics, Exercise in the (E.) .. 451
Tube well water in Rangoon, Observations on a series of bacteriological examinations of (Mackey and Jolly) (O. A.) .. 624
Tubercle bacilli in the sputum, A vaccine for the treatment of phthisical patients who expectorate (Mallannah) (O. A.) 198
———bacilli, The, Protective vaccine with dead (C. T.) 228
Tuberculin, Treatment of asthma in children with (C. T.) .. 159
Tuberculosis, Aluminium and (Duiabbasi) (C.) .. 717
———The prevention and treatment of, by an immunizing vaccine (C. T.) .. 231
———pulmonary, in different countries, A comparative study of the effect of climate and of the seasons on body weight in (Pai) (O. A.) .. 496
———pulmonary, The treatment of (C. T.) .. 524
———The successful use of a tuberculous antigen in external (Labernadie) (O. A.) 691
Tuberculous infections, Nervous manifestations (Gharpure) (O. A.) 565
Tumour, A benign spinal (Ritchie) (H. P.) 328
Tumours, abdominal, Ascariasis simulating (Henriques) (H. P.) 571
———Unusual Intra-uterine (Hari) (H. P.) .. 449
"Twilight sleep," sedatives in labour, particularly (C. T.) .. 590
Typhoid fever, Barium chloride in (C. T.) .. 698
———A case of, relapse, toxæmic collapse and recovery (Krishnamurthy) (H. P.) .. 259

U

Ubhaya, N. R. and Adiseshan, R. Maternal mortality in India: A preliminary study .. 550
Ujwal, S. D. *see* Hance, J. B. and Mody, N. C. Notes on the new conceptions of sciatic pain and on its treatment .. 541
Ulcus tropicum, Intravenous iodine in (Sarkar and Sarkar) (C.) .. 658
Ultra-violet ray therapy, observations on (C. T.) .. 31
Umar, M. A case of medico-legal interest .. 255
———Kala-azar in Bijnor .. 322
United Provinces, Indian dietaries in the (Banerji) (O. A.) .. 183
Urea Stibamine: its preparation and composition (C. T.) .. 101
Ureters, by rectal transplantation of the, A further note on the treatment of Vesico-vaginal Fistula (Fraser) (O. A.) 377

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Page

Ureters, The treatment of vesico-vaginal fistula by rectal transplantation of the (Fraser) (O. A.) .. 301
Urine, A case of suppression of (Sukhavanam) (H. P.) .. 261
——The effect of tetronal on the production of hæmatoporphyrin in the (Germuth) (O. A.) 491
——A fallacy in the "heat and acetic acid test" for albumin in (C. T.) 105
——A new test for albumen in (Bose, C.) (O. A.) .. 17
——Notes on the detection in the, of some drugs used for the treatment of malaria (Green) (O. A.) .. 614
——Observations on the excretion of alcohol in the cerebro-spinal fluid, and (Vad and Kulkarni) (O. A.) 500
——A preliminary note on a colour reaction for "693" and its application in the estimation of that compound in the urine (Boyd and Roy) (O. A.) .. 382
——Retention of, in blackwater fever (Nag) (H. P.) .. 505
Urological case, The methods of investigating (C. T.) .. 458
Urticaria, A case of (Husain) (H. P.) 692
Uterine (intra) tumours, Unusual (Hari) (H. P.) .. 449
Uterus, A distended bladder simulating a full-term (Das Gupta) (H. P.) .. 450
——Wertheim Schanta's interposition operation for complete prolapse of the (Variava) (O. A.) .. 689

Page

Valerian, The therapeutic value of (C. T.) 158
Valvulous of the large intestine at the splenic flexure, A case of (Dakshinamurthi) (H. P.) .. 256
Van de Velde, Th. H. V. Ideal Marriage: Its Physiology and Technique 167
Vareed, C. *see* David, J. C. A preliminary note on the action of vasopressin and oxytocin .. 73
Variava, D. H. Wertheim Schanta's interposition operation for complete prolapse of the uterus 689
Varicella, Herpes Zoster and (Chatterjee) (C.) .. 413
Varicose veins, The modern treatment of (C. T.) .. 104
Variola, A case of, treated by vaccination (Chatterji) (H. P.) 569
Varma, T. N. Elements of Human Anatomy and Physiology in Hindi, Parts I and II .. 350
——T. N. The treatment of night blindness .. 356
Vasopressin and Oxytocin, A preliminary note on the action of (David and Vareed) (O. A.) 73
Vasudevan, A. *see* Bradfield, E. W. C. Gastric Syphilis .. 125
Vatchaghandy S. B. A Persian treatment for oriental sore .. 572
Vedder, E. B. Medicine: Its Contribution to Civilization .. 655
Vesico-vaginal fistula, The treatment of, by rectal transplantation of the ureters (Fraser) (O. A.) 301
Village Nurse scheme, Hints on the (McGuire) (S. A.) .. 95
Viswanathan, R. A case of acute ascending (Landry's) paralysis 328
Vitamin, Antineuritic, Isolation of the (Mukherji) (O. A.) 443
——C in India, Some sources of (Wats) (O. A.) .. 79
Vomiting of "Bees" (Sircar) (C.) 598

Page

Weil's disease—epidemic jaundice—or malaria in Kandi subdivision of Murshidabad district in 1928 (Sur and Sarkar) (O. A.) .. 619
Well, Accidental suffocation in a (Prasad) (C.) .. 298
——A case of accidental suffocation in a (Henriques) (H. P.) 570
Wertheim Schanta's interposition operation for complete prolapse of the uterus (Variava) (O. A.) 689
White, R. P. The Dermatergoses or occupational affections of the skin 651
Widal reaction became positive on the 49th day, A case of enteric in which (Chatterjee) (H. P.) 695
Wiggers, C. J. Principles and practice of electrocardiography 594
Wilkinson, H. Khaki drill and skin irritation 598
William Harvey's Message to India (McRobert) (S. A.) .. 225
Willis, H. S. Laboratory diagnosis and experimental methods in tuberculosis 165
Wilson, D. W. A laboratory manual of Physiological Chemistry 408
——*P. D. and Cochrane, W. A. Fractures and Dislocations: Immediate management after cure and convalescent treatment with special reference to the conservation and restoration of function* 471
Wolff, E. A Shorter Anatomy .. 44
Worth, C. Squint: its causes, pathology and treatment .. 595
Wound dressing, Irradiated ergosterol as a (C. T.) .. 229
Wright, R. E. Ophthalmology in relation to research 217
——Webster's operation for entropion of the upper lid .. 549

V

Vaccine Tbc, Protective with dead tubercle bacilli (C. T.) 228
——for the treatment of phthisical patients who expectorate tubercle bacilli in the sputum (Mallannah) (O. A.) .. 198
Vad, B. G. and Kulkarni, N. W. Malaria therapy in tabes dorsalis 684
——B. G. and Kulkarni, N. W. A modified Sippy's line of treatment in duodenal ulcer 196
——B. G. and Kulkarni, N. W. Observations on the excretion of alcohol in the cerebro-spinal fluid and urine after oral administration 500
Vagina, A case of foreign body in the (Banerji) (H. P.) .. 26
Vaginismus A case of acute (Roy) (C.) 298
——The treatment of (Lal) (C.) 479
——The treatment of (Banerji) (C.) .. 479
——The treatment of (Mukherji) (C.) .. 718
——The treatment of acute (Pacheco) (C.) .. 478

W

Waddell, L. A. Lyon's Mediat Jurisprudence for India with illustrative cases 44
Wade, F. O. Plasmoquine .. 58
Wakeley, C. P. G. and Buxton, J. D. Surgical Pathology .. 408
Ward, E. Favourite Prescriptions 49
——*Medical Adventure: some experiences of a General Practitioner* 350
Wassermann reaction, A simple method of standardizing the red cell suspension in connection with the (Greval) (O. A.) .. 673
Wats, R. C. Some sources of vitamin C in India .. 79
Webb, Miss M. V. Peritoneal forceps 657
Webster, W. J. A note on the anophelines found in Baroda camp 197
Webster's operation for entropion of the upper lid (Wright) (O. A.) 549
Weeks, C. C. Alcohol and Human Life 652

X

X-Ray diagnosis 41
——work in Baluchistan. The new X-ray and electro-therapy department of the C. M. S. Hospital, Quetta (Barrett) (O. A.) .. 566

Y

Yatren, Eight years' experience of, in the treatment of amœbic and bacillary dysenteries and their sequelæ (C. T.) .. 276
Yellow fever danger, The (Megaw) (C.) .. 354
——Fever Prophylaxis (E.) 272
Yusuf, M. Tabes dorsalis in an Indian 448

Z

Zeganadin, A. *see* Labernadie, V. The successful use of a tuberculous methylic antigen in external tuberculosis .. 691
Ziemann, H. Gesundheits-Ratgeber Fur Waermere Zonen .. 4

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

A PRELIMINARY NOTE ON THE ACTION AND USES OF PSEUDO-EPHEDRINE.

By R. N. CHOPRA, M.A., M.D. (Cantab.),
LIEUTENANT-COLONEL, I.M.S.,
B. B. DIKSHIT, M.B., B.S., D.P.H.,
and
K. VENKATACHALAM PILLAI, L.M.&S. (Mad.).
(From the Department of Pharmacology, School of Tropical Medicine and Hygiene, Calcutta.)

FEW drugs of recent years have attracted so much the attention of the medical profession as ephedrine—an alkaloid from *E. vulgaris*, the Chinese plant Ma Huang. A considerable volume of experimental work has been done on this subject and the well compiled bibliography by Professor B. E. Read will interest those who wish for further details. The drug has been in use in China for the last five thousand years. The habitat of ephedra, however, is not confined to China but has a much wider geographical distribution. A reference to the map prepared by Liu will show that it is scattered widely all over the world. In India a number of species grow abundantly in the drier regions of the Himalayas. A few species of ephedra also grow in the plains but these contain little or no alkaloid.

The plant has not been used in the indigenous medicine in this country. Although according to Aitchison some parts of *E. vulgaris* are used medicinally in Lahoul, the drug is not mentioned in the Ayurvedic (Hindu) or Tibbi (Mohammedan) medicine. It is said that one variety of ephedra, probably *E. intermedia*, is the famous "soma" plant from which the favourite drink of the Rishis (ascetics) of the Vedic period was prepared, but there is little evidence to support this statement. The gradually increasing use of ephedrine in therapeutics and its high price induced us to explore the resources of the Indian varieties of ephedra and to study their chemical composition, pharmacological action and clinical uses. As the retail price of ephedrine at present is about 800 rupees per pound, we also investigated the sister alkaloid pseudo-ephedrine to see if any use could be made of it in therapeutics.

Watt (1890) describes three species of ephedra growing in India.

1. *Ephedra vulgaris* Rich (fl. Br. India), also known as *E. gerardiana* Wall, *E. distachya* and *E. monostachya* (Linn); it is known in the vernaculars by the names *amsaina, chema, butshur, khanda, khana, kunawar* or *phok* in different parts of India.

It is a small, low growing rigid shrub which occurs throughout the Himalayas. It grows in abundance in the dry, stony regions of the temperate and Alpine Himalayas extending from Western Tibet to Sikkim. On the Shalai Hills, North of Simla, it occurs in large quantities at an altitude close on 10,000 ft.

2. *Ephedra pachyclada* Boiss, also known as *E. intermedia* Schrenk and Mey. It is known as "hum" or "huma" in Persian, "gehma" in Bombay and "oman" in Pushtu. It is a tall shrub found in the dry, stony regions of the Western Himalayas and Western Tibet.

3. *E. peduncularis* Boiss, also called *E. alte*, Brand, *E. alata*, Myers. It is known in the vernacular as *kuchan, nikkikuran, bratta, tandala, lastuk, mangarival, bandukai di.* It is a tall scandent shrub with slender branches which grows on stony ground in Sind, the Punjab and Rajputana.

Besides these three varieties described by Watt, two more of lesser importance grow in various parts of India. (Chopra, Ghosh and Dutt, 1928). They are (1) *E. foliata* Boiss (fl. Orient), and (2) *E. fragilis* (flowering plants of Beluchistan, I. H. Burkhill). These latter varieties are uncommon.

Chopra and his collaborators (1929) describe two varieties of ephedra growing side by side on the mountain ranges bordering on the Jhelum Valley. These varieties are of special interest on account of their high alkaloidal yield. The proportion of ephedrine and pseudo-ephedrine, however, in the two varies greatly:—

1. *E. intermedia* variety *tibetica* which gives an alkaloidal content ranging from 0.2 to 1.0 per cent., of which 0.025 to 0.056 is ephedrine and the remainder is pseudo-ephedrine.

2. *E. vulgaris* or *E. gerardiana* which has an alkaloidal content of 0.8 to 1.4 per cent. of which about half is ephedrine and the balance is pseudo-ephedrine. It may also be noted here that there are marked variations in the alkaloidal content of the green twigs and the stems of these varieties. The alkaloidal content of the green twigs of the Indian *E. vulgaris* is about four times that present in the stems and that of *E. intermedia* nearly six times.

The following table gives the results of the analysis of a number of varieties of Indian ephedra we have investigated. The alkaloid was chiefly obtained from the green twigs and stems of the plant. The berries, roots and branches contain very little alkaloid. From the study of the seasonal variation which we have been carrying out, it is found that during autumn before the winter frost sets in, the alkaloidal yield is maximum.

The alkaloids were isolated by extraction with 80 per cent. alcohol, with or without previous treatment with lime or Na_2CO_3. The separation of ephedrine and pseudo-ephedrine was effected by the simple method accidentally discovered by Read and Feng when attempting to free the crude alkaloid from the coloured impurities by washing with chloroform. These workers found that after washing with chloroform the residue free from coloured impurities was practically pure ephedrine hydrochloride and that the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE.

Name of species.	Source.	Total alkaloids per cent.	Ephedrine per cent.	Pseudo-ephedrine per cent.
E. vulgaris.	Kashmere (Jhelum Valley. Shalai Hills near Simla.)	1.02-1.27.	0.5-0 6	0.5-0.6
E. pachyclada or *E. intermedia.*	Simla, Hazara and Kashmere.	1.80	0.5-0.6	
E. pachyclada or *E. intermedia* var *Tibetica.*	Jhelum Valley.	0 25-0.6	Mainly pseudo-ephedrine.	

washings contained the dextro-rotatory fraction of pseudo-ephedrine hydrochloride.

Pseudo-ephedrine is the dextro-rotatory isomer of ephedrine which is lævo-rotatory. The empirical formula and chemical structure of these alkaloids have been repeatedly studied and the results seem to be identical. Chen and Schmidt think it to be 1-01 l-methyl 2-methyl-amino 2-ethane, $C_6H_5OH—CH.CH.CH_3.NHCH_3$. The chemical composition differs from epinephrine in that it contains no phenolic hydroxy group but has an extra methyl radical. The similarity of the structure suggests a sympathomimetic action like epinephrine and as is well-known, this is true in actual practice.

From the table given above, it will be seen that the *tibetica* variety of *E. intermedia* contains a high percentage of pseudo-ephedrine.

Although the action of ephedrine has been fully worked out, that is not the case with pseudo-ephedrine. This latter alkaloid is said to possess most of the actions and properties of ephedrine, while according to Chen its toxicity is much lower. The lesser toxicity of this drug may be a distinct advantage for its therapeutic use and it was for this reason that we investigated its pharmacological action. We wished not only to confirm the work which has already been done but also paid special attention to those actions of the alkaloid which help to elucidate its therapeutic value in such diseases as asthma, cardiac disease, etc.

Pharmacological Action.

The action of ephedrine and pseudo-ephedrine obtained from the Indian varieties of ephedra on the heart is fully discussed in a separate paper (1929*a*). The main conclusions are that pseudo-ephedrine stimulates both the inhibitory and the accelerator mechanisms of the heart and has a stimulating influence on the myocardium. The rise of blood-pressure is not so great as in the case of ephedrine and is only partly due to sympathetic stimulation as it is still produced when the sympathetics are paralysed with ergotoxine. The occurrence of the rise after the vaso-motor fibres are paralysed shows that the alkaloid stimulates the unstriped muscle fibres of the blood-vessels; there is also reason to believe that the cardiac muscle is stimulated.

The rise is well marked in a cat with such doses as 2 mgms. and persists for from 20 to 35 minutes. This is seen in Graph I, fig. (*a*). Repetition of injections does not evoke an equally great response, the height of the pressor effect being gradually diminished as the number of injections increases.

The pulmonary pressure shows a marked rise (Graph I, fig. *c*), the action resembling that of adrenalin. This is one of the most constant effects of the drug. The rise appears to be due to contraction of the branches of the pulmonary artery which also relieves the turgescence of the mucous membrane. There is at the same time a well marked dilatation of the bronchioles and both these factors help in relieving the paroxysms of asthma. Graph I, fig. (*a*), shows the dilatation of the bronchioles produced after an injection of 2 mgm. of the alkaloid. In this experiment the intra-pleural pressure was recorded in a decerebrated cat by a tambour, while the lungs were artificially inflated with fixed volumes of air at regular intervals by a respiration pump. Dilatation of the bronchioles in such an experiment will admit more air into the lungs which will increase the excursions of the lever of the tambour. Graph I, fig. (*b*), shows a similar experiment in which an asthma-like condition was produced in an animal under chloralose by giving it an injection of pilocarpine. The marked spasm produced by the drug was relieved immediately by an intravenous injection of 2 mgms. of pseudo-ephedrine, showing that the drug has a powerful bronchodilator effect. Graph II, fig. (*d*), shows that along with the rise of systemic blood-pressure and pulmonary pressure there is also a well marked rise of the venous pressure recorded in the femoral vein.

The sympathomimetic action of the drug is also clearly shown in Graph II, fig. (*a*), in which the intestinal movements in situ, of an animal under chloralose, are being recorded. It will be seen that immediately after an injection of 2 mgm. of pseudo-ephedrine, the movements of the gut are abolished and there is well marked relaxation of the intestines. Perfusion of a piece of an isolated ileum of the rabbit shows a similar effect. Movements of the uterus of a cat in situ as well as of the isolated uterus in a uterine bath show marked inhibition and may stop altogether. Graph II, fig. (*c*), shows the record of spleen volume in a cat under chloralose. Injection of 2 mgm. of pseudo-ephedrine produces a persistent rise of blood-pressure accompanied by a marked

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

GRAPH I.

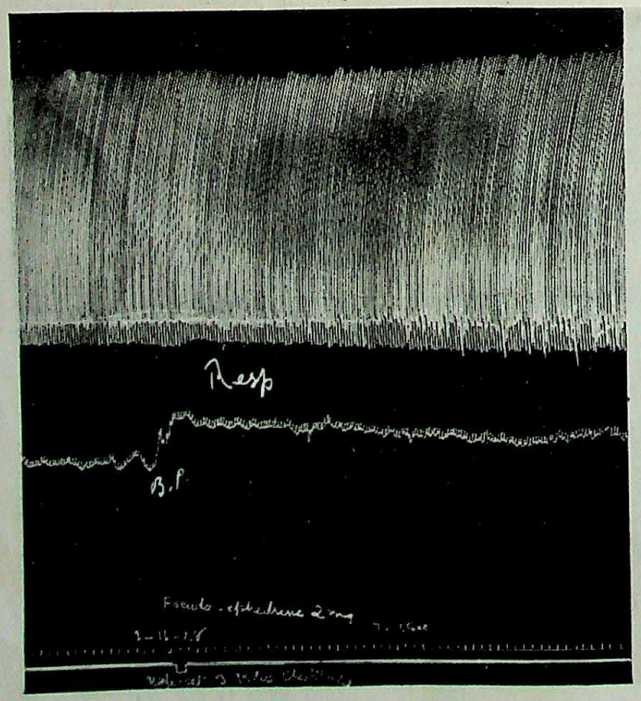


Fig. (*a*).—Upper tracing shows record of lung volume obtained by a cannula in the pleural cavity; lower tracing carotid B.P. Note prolonged and persistent rise in B.P. and marked dilatation of the bronchioles.

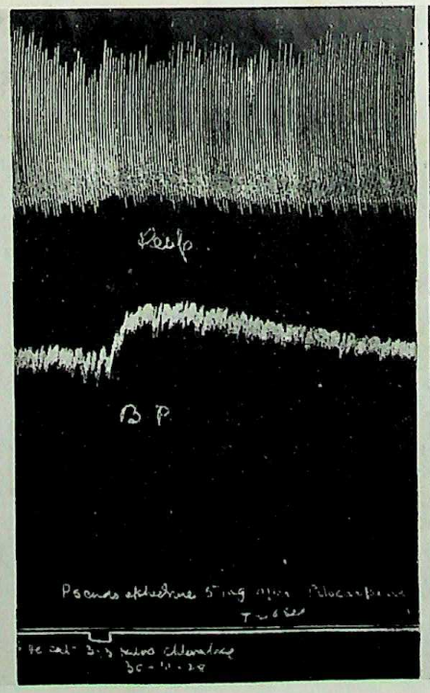


Fig. (*b*).—Upper tracing respiration; lower that of carotid B.P. 5 mg. of pseudo-ephedrine injected after 1 mg. of pilocarpine. Note relaxation of contracted bronchioles.

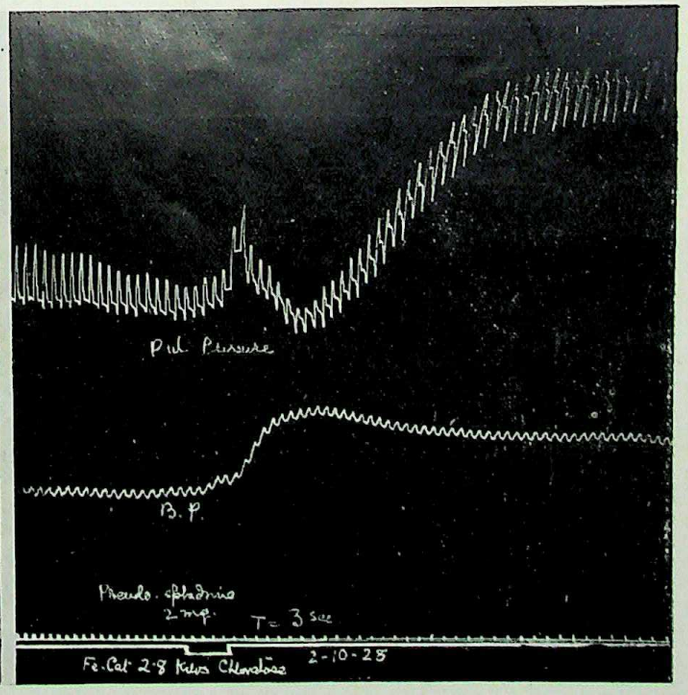


Fig. (*c*).—Upper tracing pulmonary pressure; lower tracing carotid B.P. Note increase in the pulmonary pressure corresponding to the increase of systemic pressure.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

GRAPH II.

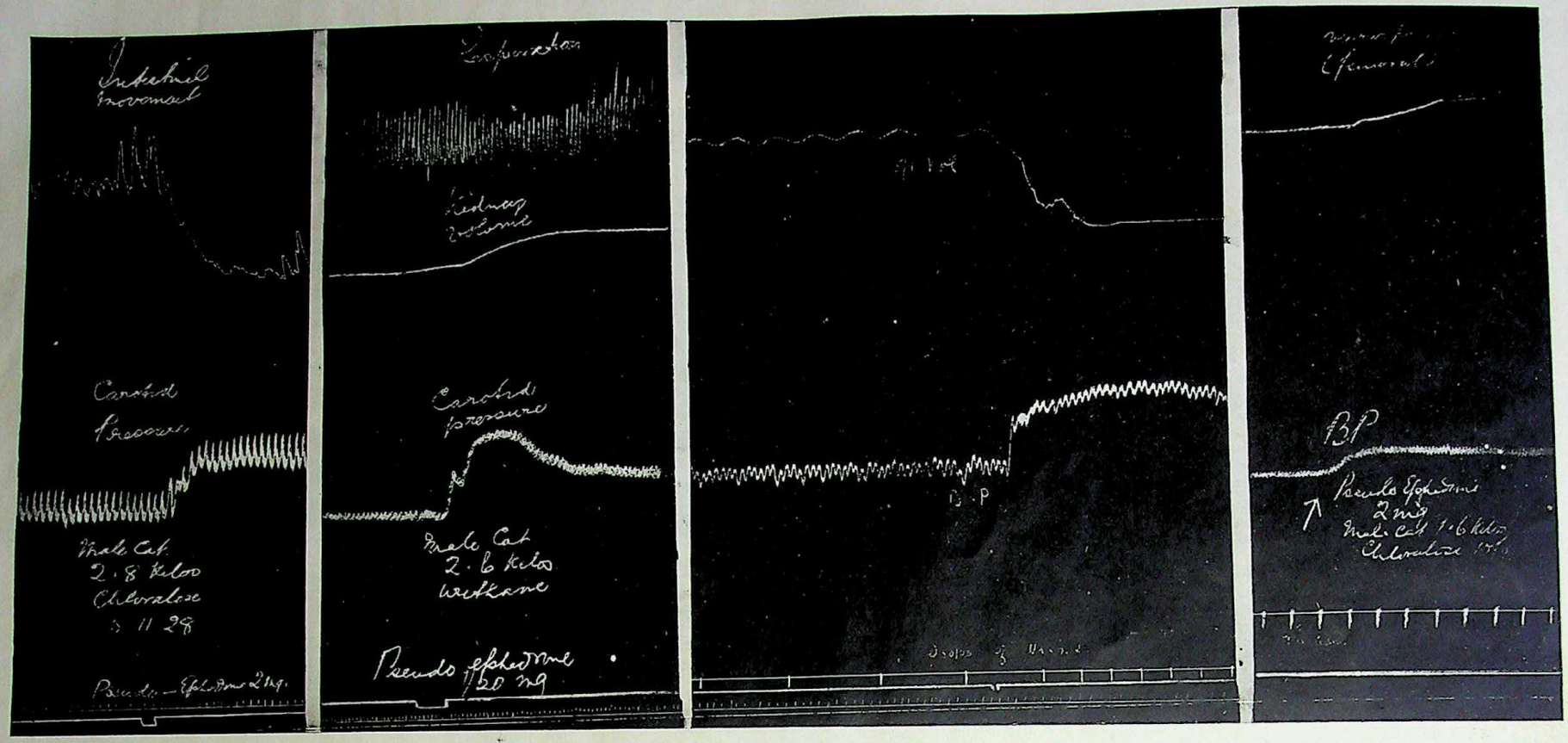


Fig. (*a*).—Upper tracing, intestinal movements in situ; lower tracing, carotid B.P. Note marked relaxation and inhibition of movements of intestines and rise in B.P.

Fig. (*b*).—Upper tracing, respiration; middle, kidney volume; and lower, carotid B.P. Note marked increase in the kidney volume corresponding to the rise in carotid B.P. Respiration shows relaxation of the bronchioles.

Fig. (*c*).—Upper tracing, spleen volume, middle, carotid B.P.; and lower, record of drops of urine. Note the marked contraction in the spleen volume and increase in the flow of urine.

Fig. (*d*).—Upper tracing, B.P. in the femoral vein; lower tracing, carotid B.P. Note the increase in pressure in the vein corresponding to the increased B.P. in the carotid artery.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Digitized by Arya Samaj Foundation Chennai and eGangotri

contraction in the size of the spleen resembling that obtained by adrenalin.

The volume of other abdominal viscera such as the kidneys shows an increase after an injection of the drug (Graph II, fig. *b*). These effects are produced by general rise of blood-pressure all over the body produced by the vasoconstricting action of the drug which forces the blood into the splanchnic area. It is also to be noted that the increase in the volume of the kidney corresponds to the increase in the systemic blood-pressure; when this falls to normal, the kidney volume also becomes normal.

The increase in the volume of the kidney suggested that the alkaloid might have a diuretic action; the urine flow was, therefore, measured by putting a cannula into the ureter. Graph II, fig. (*c*), shows the effects of an injection of pseudo-ephedrine on the kidney secretion; the drops of urine emerging from the cannula were recorded on the drum by an electro-magnet. It is quite clear that the rate of secretion is markedly increased and it was also noted that the acceleration of the urine flow lasted as long as the blood-pressure effect lasted.

Therapeutic uses of pseudo-ephedrine.

We have already remarked that even under the best of conditions the yield of ephedrine from different varieties of ephedra growing in this country does not exceed 50 per cent. of the total alkaloids and ephedrine is a very expensive drug even now, though its price has been reduced from Rs. 1,100 per pound to Rs. 800 per pound. Some of the Indian varieties contain large quantities of pseudo-ephedrine and little ephedrine. In view of these facts we tried to see how far it was possible to substitute pseudo-ephedrine for ephedrine. The senior author has been using a liquid extract, made from both *E. vulgaris* and *E. intermedia,* for some time in the treatment of asthma with good results. The extract is prepared by exhausting the dried powdered twigs with 90 per cent. alcohol, sufficient water being then added to make the strength of alcohol about 45 per cent. 5 c.c. of the extract contain ½ gr. of the alkaloids. He has also tried this preparation as a cardiac stimulant and, though in both cases the series of patients was not large, the results were encouraging. The extract produced a well marked beneficial effect when administered to patients in whom the action of the heart was weak and compensation was failing. Our observations on a number of patients showed that there was a definite rise of blood-pressure amounting to 10 to 20 mm. of Hg. after 60 minim doses of the extract of ephedra were given three times a day. Marked diuresis was produced in those patients in whom the function of the kidneys was disturbed from inefficient circulation.

We have also used the pure alkaloid pseudo-ephedrine for the relief of attacks of asthma in place of ephedrine with excellent results. Within 15 minutes to half an hour of the oral administration of ½ gr. of this drug, the feeling of tightness round the chest is relieved and the patient's breathing becomes normal. A similar dose, taken when the premonitions of an attack are felt, generally stops the paroxysm.

Ephedrine is a powerful alkaloid and our experience with its use in the treatment of asthma has not been altogether satisfactory. It undoubtedly controls the paroxysm and relieves the symptoms in 15 minutes to half an hour, but it is likely to produce unpleasant side-effects. We have noticed in some patients acute pain in the cardiac region lasting 10 to 20 minutes. A feeling of distress in the præcordium is not an uncommon symptom in a large number of cases. Patients may also complain of palpitation, flushing of the skin and tingling and numbness of extremities and tachycardia may be produced. In patients with organic disease of the heart it may produce decompensation. Besides this the stimulating effect of the alkaloid on the sympathetic is liable to produce constipation which aggravates certain types of asthma. Loss of appetite is not infrequently produced. This drug has not been in use sufficiently long for us to know all its untoward and toxic effects but we have evidence that they do exist. Caution is, therefore, recommended in its use especially for prolonged periods in the treatment of such diseases as asthma. Its routine use in controlling paroxysms is to be deprecated.

The action of pseudo-ephedrine on the sympathetic is not so powerful as that of ephedrine but its bronchodilator action appears to be quite marked. It relieves paroxysms of asthma almost as quickly as ephedrine but we have not yet tried it in a sufficiently large number of patients to come to any definite conclusion regarding its side effects. The results so far have been encouraging, and the side effects as judged from our small series of patients are not so unpleasant as those of ephedrine. If the use of this alkaloid is extended in the treatment of asthma and other conditions for which ephedrine is being used, not only will the cost of treatment be reduced but it may also be possible to avoid some of the unpleasant side effects of the latter drug. The use of an alcoholic extract made from ephedra will still further reduce the price and make it accessible for all classes of patients.

Summary and Conclusions.

(1) Pseudo-ephedrine occurs in most of the Indian varieties of ephedra in large quantities.

(2) The pharmacological action of pseudo-ephedrine closely resembles its isomer ephedrine, the difference being only a question of degree.

(3) As ephedrine is an expensive alkaloid costing Rs. 800 per pound, pseudo-ephedrine was tried clinically in such conditions as asthma, failing heart, etc., with encouraging results.

(4) Ephedrine gives rise to unpleasant side effects. Although the series of cases in which pseudo-ephedrine was tried is small the unpleasant side effects were not so prominent as is the case with ephedrine.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(5) A liquid alcoholic extract prepared from crude ephedrine has been successfully used in therapeutics in place of the purified alkaloids.

Both the ephedrine and pseudo-ephedrine used are articles of Indian manufacture and alkaloids of excellent quality are manufactured from the Indian varieties of ephedra and sold by the Bengal Chemical and Pharmaceutical Works and the Union Drug Co. of Calcutta. The latter firm has put an alcoholic extract of ephedra on the market.

REFERENCES.

Chopra, R. N., Ghosh, S. and Dutt, A. T. (1928). Ephedrine from the Indian varieties of Ephedra. *Ind. Jour. Med. Res.*, Vol. XV, No. 4, p. 889.

Chopra, R. N., Ghosh, N. N. and Ratnagiriswaran, A. N. (1929). Some medicinal plants growing in the Himalayas No. II. *Ind. Jour. Med. Res.*, Vol. XVI, No. 3.

Chopra, R. N., Dikshit, B. B. and K. Venkatachalam Pillai (1929*a*). Comparative action of ephedrine and pseudo-ephedrine from Indian varieties of Ephedra on the heart. *Ind. Jour. Med. Res.*, Vol. XVI, No. 3.

Watt, G. (1890). *A Dictionary of Economic Products of India.*

THE CONTINUOUS ADMINISTRATION OF SALINE PER RECTUM.

By A. H. PROCTOR, M.D., M.S., F.R.C.S.E.,
LIEUTENANT-COLONEL, I.M.S.,
Presidency General Hospital, Calcutta.

TWENTY years ago J. B. Murphy wrote regarding appendicitis, "We have treated on this plan forty-seven consecutive cases of peritonitis, of the direct perforative type, with two deaths, one, the sixteenth case, of a double pneumonia six days after operation, long after all peritoneal symptoms had subsided, the other, the forty-fifth case, died on the fourth day from an intestinal obstruction due to the twisting of the ileum around the omentum, which was adherent to an old hernial opening." (Keen's Surgery, Vol. IV, p. 789).

To-day at two of the leading hospitals in England, these cases have a mortality of 20 per cent. and 29 per cent. against Murphy's 4.25 per cent. (Recent advances in Surgery, p. 291). Assuming Murphy's figures to be correct, the only possible explanation is some radical difference in the treatment. Now the essential factor in Murphy's treatment was the prolonged administration of normal saline and calcium chloride solution per rectum.

Every surgeon will be prepared to swear that he also uses continuous saline per rectum in these cases. It would probably be nearer the truth if he said he prescribed it.

How often does the nurse report that the saline was stopped, because the patient started to reject it after three or four pints had been given?

In one large hospital, I am told, they have given up rectal saline in favour of subcutaneous saline, a route which has obvious limitations.

A reference to the standard text-books on nursing, would lead any one to suppose that the details Murphy insists on, are not essential, and both by surgeons and nurses there has been a general failure to grasp his principles. These principles are two, namely:—

I. That the saline shall be administered at the rate of absorption, so that at no time is the rectum distended with fluid.

II. That there shall be, at all times, a free outlet for flatus. The object is the same, to avoid the distension of the rectum.

Distension is the normal stimulus to the rectum to empty itself, and if the flatus has not a free outlet, it will be forced by the side of the rectal tube into the bed. In its passage it is accompanied by the fluid contents of the rectum, and further administration is stopped, because the patient is considered to be rejecting the saline. If the flatus cannot escape past the rectal tube it passes back up the colon and disturbs the quiescence of the bowel, which is so essential for recovery. At the same time it causes pain and discomfort which is attributed to the proctoclysis, and provides another excuse for stopping the saline.

Murphy's technique naturally observed these principles, but it was always difficult for nurses to manage satisfactorily. Either the can was placed too low and the patient only received an intermittent supply, or it was placed too high and the bed was flooded. Murphy's description indeed is open to the criticism that it fixed an arbitrary position for the reservoir, and a varying head of fluid depending on whether the reservoir was full or nearly empty. The temptation to regulate the flow by droppers, clamps, or by altering the position of the reservoir was irresistible.

Certain modifications of Murphy's technique, which do not violate his principles, have overcome the difficulties. Two simple experiments will enable the essential points to be grasped by the nurse in charge.

Experiment I.

Take the barrels of two four-ounce glass syringes and connect them up with a length of rubber tubing about four feet in length. Call one "A" and let it represent the rectum. The other "B" represents the supply funnel. Holding them on the same level fill them with water until they are half full. Now keeping "A" fixed move "B" up and down. It will be noted that as "B" moves up the level of the water in relation to the top of the funnel moves down, and vice versa. The level of the fluid in fact remains stationary, depending on the level of the fluid in "A," which represents the rectum in actual life. In other words all that we need to do, to determine the level of a pool of fluid in the rectum, is to connect it by a tube to a funnel, and fix the funnel so that the level of the fluid shows in the funnel.

Experiment II.

Bring "A" and "B" close together, letting the tube hang down in a loop. Blow down "A"

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and estimate the effort required to blow air out through "B." Then straighten the loop by separating the funnels to the maximum without kinks, and try again. Repeat the experiment after introducing a dropper or a clamp as is commonly done to regulate the flow.

It is at once obvious that loops, clamps, droppers, etc., are adequate obstacles to the return of flatus. The practical application of these observations is as follows:—

A cylindrical funnel, such as the glass funnel of an army pattern salvarsan apparatus or the barrel of a four-ounce syringe, is connected up with the rectal nozzle. The whole apparatus is now filled with saline solution so that when the rectal nozzle is held level with the middle of the funnel the solution is just bubbling over the tip of the nozzle.

The funnel is now lowered in relation to the nozzle, and the latter inserted into the rectum.

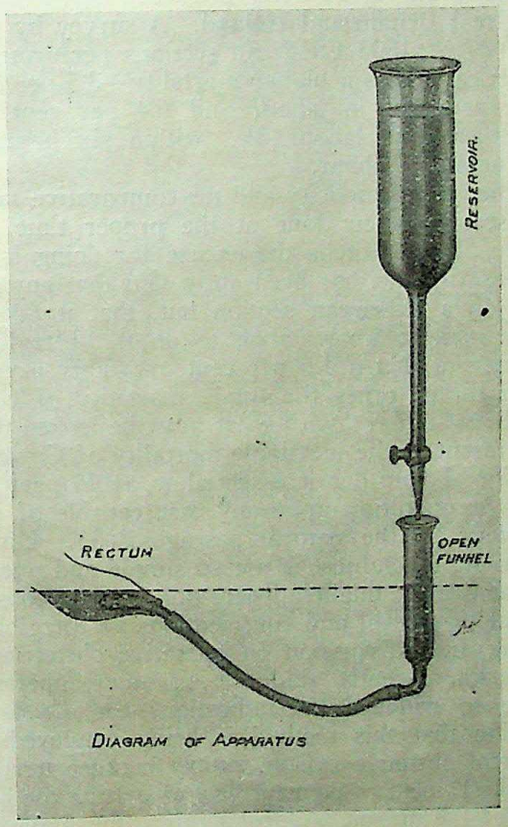


DIAGRAM OF APPARATUS

The funnel is raised and four to six ounces more fluid run into the rectum. The funnel is now carefully raised and lowered until we ascertain the position where the fluid just half fills the funnel. It is fixed at this point, and any loops or kinks straightened out. The level of the fluid is now exactly the same as the level of the pool in the rectum, and if correctly adjusted rises and falls with respiration. Now above the funnel we suspend a heated reservoir or vacuum flask containing the bulk of the saline solution. Leading from it is a tube and dropper, by means of which the solution can be dropped at any required rate into the open mouth of the funnel. The rate of flow is accurately determined by measuring the quantity into an ounce measure, and taking the time.

At present the supply funnel is being kept warm by means of a hot water bag wrapped round it. A more satisfactory arrangement is to have an electrically heated section of piping between the funnel and the rectal nozzle. This section of pipe, however, must be straight and not in the form of a spiral as is usual in such apparatus. Attention may profitably be called to other points that were insisted upon by Murphy.

The nozzle should be a vaginal hard rubber or glass tip, flexed at an obtuse angle two inches from the tip, and having numerous openings. It should be inserted so that the angle fits closely to the sphincter and the tube is then bound firmly to the thigh with adhesive plaster so that it may not be expelled. Many books recommend a rubber catheter and that it be passed as far as possible into the rectum. This is wrong. Murphy insisted on numerous openings and that it be passed only as far as the obtuse angle, that is, for two inches.

The rate of flow should be such that it requires not less than forty nor more than sixty minutes for a pint and a half of the solution to percolate into the rectum. The proctoclysis should usually be continued for three days, rarely as long as five or six. The solution he used was normal saline with one drachm to the pint of calcium chloride. Murphy recommended the administration of a pint and a half every two hours. At the same time he advocated a rate of flow of a pint and a half in one hour. It is presumed, therefore, that he gave his patients alternate hours of rest, except in the severer cases, for he quotes the case of a child of eleven absorbing thirty pints in twenty-four hours. From personal experience I am satisfied that a strict adherence to Murphy's methods produces better results than those quoted from "Recent advances on Surgery" at the beginning of this note.

N.B.—Murphy's technique has been given above. In practice at the Presidency General Hospital we use isotonic saline and glucose solution and a somewhat slower rate of flow approximately $\frac{3}{4}$ to 1 pint per hour.

CÆSAREAN SECTION. SOME TYPES AND THEIR USES.

By S. A. McSWINEY, B.A., M.B., B.Ch., F.R.C.S.I., MAJOR, I.M.S.,
Professor of Clinical Obstetrics (Offg.), Medical College, Calcutta, and Second Surgeon, Eden Hospital, Calcutta.

I. THE CLASSICAL CÆSAREAN SECTION.

THIS is the best known, the simplest and is still the most commonly practised type. Its uses be within certain well-defined limits and, therefore, it will be discussed in some detail. The technique varies somewhat in different centres: that described below is the one which has been found most useful in this hospital.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The abdomen is opened, after passing the catheter, by a median (or paramedian) incision between the symphysis and the umbilicus about 5—6 inches long: the exact length depends on the amount of fat on the abdominal wall, but it must allow of an incision 4—5 inches long in the uterus. The incision in the abdominal wall must be carefully made because the latter is often surprisingly thin. The uterus is then "centred"; it is to be remembered that the uterus is normally tilted a little to the right and rotated to the right, and therefore, it is wise to "centre" it before incising it. Swabs are then packed around to prevent blood and liquor amnii from escaping into the peritoneal cavity: the uterus is incised in line with the skin incision. This incision in the uterus is slowly and gradually deepened along its whole length. The operator must not be flurried by the bleeding which may be very free nor should any time be wasted in trying to pick up bleeding points: they will stop when the uterus is empty. Care must be taken not to cut the baby. (If the placenta is in front, the bleeding will certainly be free. It should be either pushed aside or incised). When the membranes are opened, there will be a rush of liquor amnii. The fingers should be slipped into the uterus and by guarding the baby with them, the incision can be rapidly completed. The first assistant hooks his finger into the upper angle of the uterine incision and keeps the uterus hitched up close to the abdominal wall so as to lessen the spill of blood and liquor amnii into the peritoneal cavity. The child is grasped by the leg and delivered: a second assistant clamps and cuts the cord and takes charge of the baby. (The baby is usually under the influence of the anæsthetic, therefore, no undue anxiety need be felt if it does not cry lustily at once: nor should any but the gentlest methods of artificial respiration be used. Any other methods are always dangerous and here they are useless as well as dangerous). The first assistant now delivers the uterus outside the abdomen: 1 c.cm. of pituitrin is injected into the uterus itself. (Some operators prefer to inject it into the mother's deltoid just as the operation is commenced.) Hot towels are wrapped around the uterus and, if the hæmorrhage is excessive, the assistant slips his hand into the pouch of Douglas and grasps the cervix to control the bleeding. The placenta is then delivered into the wound and the membranes are carefully peeled off by gauze pressure.

Suturing of the uterus is then carried out in two layers as follows:—the first layer is of strong silkworm-gut, 1 cm. apart; this picks up all the layers except the mucous membrane. The second layer of No. 1 catgut is continuous; this picks up peritoneum and a very little muscle so as to "Lembert" completely the first layer. The suture material is of importance. Catgut is commonly recommended throughout. It is not reliable in the process of auto-digestion that goes on in the involuting uterus and is likely to leave a weak scar. Silk might be used, as recommended by Spencer, but is more likely to absorb sepsis spreading through the mucous membrane. No case of rupture of the scar from one of our cases has been reported, although many have been through succeeding pregnancies, and, what is the supreme test, some have been through succeeding labours.

The utero-vesical and Douglas's pouches are swabbed clear of blood-clot and the omentum is brought down behind the uterus. The patient is sterilized by cutting and tying the tubes, if it is considered necessary, and the abdomen is closed in layers.

This operation, if carried out by an operator of average skill and in suitable surroundings, is attended with a low death-rate, provided that it is done *before, or just at the onset of labour.* The mortality in such cases is estimated to be 1.6 to 1.8 per cent. by Eardley Holland(1) in his masterly survey of 3374 Cæsarean sections done in Great Britain and Ireland. A survey by Gordon(2) of 1805 Cæsarean sections performed in America, shows a higher mortality—3.5 per cent. for cases not in labour and 6.4 per cent. for cases early in labour, i.e., within six hours of the onset of labour.

The great simplicity and the comparative safety of section when done at the proper time and place, should not be the excuse for doing it unnecessarily. It has been aptly said that any fool can do a Cæsarean section but, that it takes a wise man to know when to do it. Fitzgibbon points out that a 1.6 per cent. mortality is more than three times the total mortality of childbirth and adds: "with what must be looked upon at present as the inevitable mortality of Cæsarean section, I consider it essential to avoid performing the operation upon any case capable of safe delivery by the natural passages."(3). Unfortunately, the subject is not so simple and uncomplicated as it might appear, nor is every obstetrician as careful and conscientious as Fitzgibbon. Polak, in a discussion on operative obstetrics in America, recently said: "....other operators have so widened the indications for Cæsarean section that this method is being employed for no real obstetric reason, simply because it is the quickest, most convenient way of getting the baby out of the uterus." Most illuminating figures of the frequency of sections were collected from various hospitals in America in 1925 by Dr. Tottenham(4) who was then on his way to take up the Professorship of Obstetrics in Hong Kong. They show an amazing discrepancy and are as follows:—

Jefferson Hospital Philadelphia	1	Cæsarean to	6	deliveries.
Boston Lying-in Hospital	1	" "	12	"
Bellevue Hospital, New York	1	" "	97	"
Johns Hopkins Hospital..	1	" "	125	"
Swedish Hospital Minneapolis	1	" "	201	"
New York Lying-in Hospital	1	" "	585	"
Burnside Hospital Toronto	1	" "	861	"

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

There cannot possibly be such a difference in the physique of the women in Philadelphia and Toronto to account for the difference between 1 to 6 and 1 to 861! The difference is rather, in the obstetrical skill and care of the medical attendants.

The public is even more gullible about Cæsarean sections than about most things, and it never fails to be thrilled by the operation which is, to them, intensely dramatic. If a doctor expends the most meticulous care and patience on a woman during a long and tedious labour and gives her a live baby through the natural passages, he will be considered to have done only what any midwife could have done and he will be given the usual confinement fee: whereas, if he had walked into an operating theatre at an hour and date suited to his convenience and done the section (which would mean about half an hour's work devoid of anxiety), his name would be mentioned with bated breath in half the houses in the town, and—this of course had not affected his judgment—the fee willingly given to such a superman, would be three times his usual confinement fee. The public is firmly convinced, that the man who does the most sections, is not the worst obstetrician but manifestly the best. They do not realise, that a woman who has once had a Cæsarean section done and escaped its dangers, subjects the scar to a very severe test in each succeeding pregnancy and labour—a danger which is a very real one. George Bernard Shaw states that the public is absurd in the reliance it places on the rectitude of the medical profession: he says that if a bridge is unsafe, the opinion of one expert is taken about its lack of safety and its destruction is handed over to another. But, if a leg has to come off, the public foolishly asks the man who is to take it off for his opinion as to whether it should come off or not. If for amputation of the leg, one substitutes Cæsarean section, the remark would be more apt and pointed.

Most obstetricians know of sections done for all manner of inadequate reasons: I have heard of one, the indication for which was that the lady—who had quite a roomy pelvis—had no legal right to have a baby at all! An example of another unnecessary section is given in the following case which is so instructive of the amount of meddlesome midwifery that occurs, that no apology is made for quoting it at some length:—

Ch., Hindu, aged 30 years, 7th gravida, was admitted to the Eden Hospital on 4th May 1925 at midnight. Last period August 1924. Her obstetrical history, given by her relative—a medical man—was:—the first four pregnancies ended in craniotomies: the fifth in Cæsarean section at term in 1921: the sixth in a premature labour and natural delivery at 8 months. "She is now brought for another craniotomy" he casually explained to me. Labour was said to have begun at 6 p.m. on the 4th May and the membranes ruptured some hours later. When seen by me, at 2 a.m. on the 5th May, her condition was as follows:—

Condition good. T. 99.8. P. 96. Uterus, size of full term. Vertex R.O.P. F.H.S. 148. Measurements:—7 inches, interspinous: 9 inches, intercristal: external conjugate, 7 inches: transverse diameter of the outlet, 4 inches. P. V., os fully dilated: anterior lip œdematous; no bag of membranes: vertex presenting: very slight caput; no disparity between the size of the head and the pelvis discoverable by Munro Kerr's manœuvre: diagonal conjugate 4¼ inches. The head and anterior shoulder were rotated manually to convert it into R.O.A. presentation and a binder was applied. At 9 a.m. the head had gone down into the pelvis. I applied the forceps and a live baby, weighing 7 lbs. 13 ozs. was delivered easily! The mother and baby left the hospital quite well on 14th of May. When one realises that this baby weighed two pounds more than the average Bengali baby and that it was delivered by easy forceps after 15 hours labour, one wonders what the indication was for the Cæsarean section and the ghastly succession of craniotomies. My own theory is, that the latter were instances of meddlesome midwifery and that the section was done hurriedly, without a careful examination, on account of the dreadful tale of woe of the previous labours.

The decision to do a section or not, should be arrived at as a result of a cool, calm and deliberate judgment. Extreme degrees of contraction are not likely to be overlooked by the average medical man and the decision offers no difficulty: the difficult cases are those with minor degrees of contraction, and these are the cases which are often overlooked until a difficulty arises during delivery. Here again, one should remember that Fitzgibbon states that 75 per cent. of all cases of medium and minor degrees of contracted pelvis will deliver themselves. A patient told me recently that she was to have been delivered by Cæsarean section of her first baby, but that she had the baby so easily and quickly, that there was no time to perform the operation! The baby weighed 9 lbs.

The question of a test labour or Cæsarean section, arises in these borderline cases. A careful examination under an anæsthetic is always a wise and often a necessary procedure. The points in favour of a test labour are:—youth and good health of the patient: measurements not much below normal: i.e., true conjugate 4 inches—3½ inches: no marked disparity between the size of the head and the pelvis by Munro Kerr's manœuvre, (the parietal boss should not overlap the anterior edge of the symphsis): premature onset of labour: anterior vertex lie of the child: good pains if labour has started (or a history of them in previous labours): and softness of the cervix. The points that weigh down the scales in favour of section are:—constitutional disease or toxæmia of the mother: bad obstetrical history: ad-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

vanced age of the patient: measurements well below normal, i.e., true conjugate below 3½ inches: marked disparity between the head and the pelvis as shown by Munro Kerr's manœuvre: malpresentation or posterior lie of the vertex: weak pains or a history of primary uterine inertia: rigidity of the cervix and, lastly, if the patient desires to be sterilized. Two factors are impossible to estimate before labour, without a previous history. They are (*a*) the strength with which the uterus will contract and (*b*) the ease with which the cervix will dilate. Primary uterine inertia is much commoner in India than in England and, when it is associated with a rigid cervix and early rupture of the membranes, it causes one the greatest anxiety. It is particularly common in squat, shortnecked, stout women—they often have a uterus like a paper bag.

What is a test labour? This varies with the ideas of different obstetricians but, in as much as some strong pains in the second stage are usually required to drive the head in a doubtful case into the pelvis, a test labour should be allowed to progress long enough for some contractions in the second stage to take place.

If a test labour has been decided upon and fails after a fair trial, or if one sees the patient for the first time, only after she has been in labour for many hours or days and the membranes have ruptured many hours before, then the time for the classical Cæsarean section has passed, and its performance is fraught with great danger. This is proved by Eardley Holland's figures as follows:—

	Per cent.
Mortality in cases operated on before the onset of labour	1·6
Mortality in cases operated on early in labour ..	1·9
" " " , after attempts at induction	14
" " " " unsuccessful attempts with forceps	25
Mortality of cases operated on after unsuccessful attempts at craniotomy	50

These figures show that the classical section should be done only before, or very early in labour, and that every hour in labour spells danger, which increases by leaps and bounds as a result of attempts at induction, forceps application and craniotomy.

The extremely valuable work by Harris and Browne(5) confirms the above. These workers took cultures, by the abdominal route, from the lower uterine segment in 50 consecutive Cæsareans at Johns Hopkins Hospital. They proved:—

(*a*) That the uterus was sterile if the section was done before labour and before rupture of the membranes.

(*b*) That out of 29 cases less than six hours in labour the uterus was sterile in 28, whereas in 21 cases more than six hours in labour the uterus was infected in all.

(*c*) That the uterus was infected in all cases in which the membranes had ruptured.

(*d*) That the uterus was infected in all cases in which vaginal examinations had been done.

These are the cases which call for the second type of Cæsarean section, i.e., the lower uterine segment type.

II. The Lower Uterine Segment Cæsarean Section.

The names of two authorities are associated with this type, i.e., Munro Kerr and De Lee. Their methods are different and must be carefully distinguished.

The technique of Munro Kerr(6) is as follows:—

The vagina is sterilized as carefully as possible and the abdomen is opened by a median (or paramedian) incision, 6 inches long, from the symphysis upwards. Doyen's retractor is inserted and the exposed area of the uterus is carefully packed off. The peritoneum is incised transversely 1 inch below its loose attachment to the uterus and an upper and lower flap of peritoneum are raised up. The lower flap with the bladder is retracted downwards. The lower uterine segment is opened by a slightly curved transverse incision, convexity downwards, (carefully made because the wall here is very thin). The hand inserted into the uterus directs the head out of the wound: the assistant, by making pressure on the fundus and sides, helps to direct the baby out of the uterus. (Occasionally forceps may be applied to the head). The placenta is delivered out of the wound if the cervix is not well dilated, or, if the cervix is well dilated, the placenta is delivered into the vagina after closure of the abdomen. The cut edges of the uterus are held by sponge-holding forceps and sewn up with catgut in three layers. Lastly, the peritoneum is overlapped over the uterine incision, covering it securely and the abdomen is closed. A drain may be left in the lower angle of the wound if necessary.

De Lee's method differs from the above in two points:—

(*a*) The bladder is separated from the lower uterine segment and retracted downwards, and (*b*) the incision into the lower segment is longitudinal and not transverse. He claims that this means (*a*) less bleeding from the uterus and no danger of opening a large vessel at the side of the uterus (which may happen with a transverse incision), (*b*) a greater bar to the leakage of sepsis out of the uterus is provided by not merely a fold of peritoneum—as in Munro Kerr's method,—but by replacing the bladder over the uterine incision, (*c*) better facilities for draining later on if necessary, through an anterior colpotomy wound, (*d*) a more secure scar, which is less strained during a subsequent pregnancy and labour.

An objection to De Lee's section is, that the lower uterine segment must be well dilated by labour, otherwise the upper end of the vertical uterine incision may extend into the upper uterine

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

segment. Munro Kerr's section however, can easily be done irrespective of whether the patient has been in labour or not. A full and beautifully illustrated description of De Lee's Cæsarean section is to be found in his text-book of obstetrics. The abdomen is opened as in Munro Kerr's section and a retractor is inserted as above. Briefly the chief points are that, after the peritoneum is incised transversely and an upper and lower flap raised up, the bladder is then separated from the lower uterine segment by finger and gauze pressure. The bladder is then retracted downwards and the lower uterine segment is opened by a longitudinal incision. The hand inserted into the uterus rotates the head to bring the face into the wound. The face is then helped out of the wound by forceps or manipulation and the rest of the baby follows. The placenta is delivered into the wound and the membranes are wiped off by gauze pressure. If bleeding from the uterus is free, it is plugged with gauze which is led into the vagina. The uterine wound is sewn up in three layers with interrupted catgut sutures. The bladder is replaced over the wound and the peritoneal flaps are overlapped and sewn up. The abdomen is then closed.

In the lower segment type of operation, nothing should come into the field of the operation except the lower part of the uterus. There is, therefore, very little soiling of the peritoneum. A great advance has, therefore, taken place by providing for late cases, a method which is very much safer than the classical method. Stein and Leventhal(7) have published a record of 32 cases which had test labours and which were afterwards delivered by the lower uterine segment incision. The mortality was nil: the shortest time in labour was twelve hours and the longest 66 hours, the average being 29.8 hours. Danfort and Greer(8) similarly have reported 30 cases safely delivered by this method after having test labours averaging 21.7 hours. Most authorities agree that this new method should displace the classical operation in cases of doubtful infection, and some authorities are so enthusiastic that they urge the complete abandonment of the classical operation in favour of the lower uterine segment section in all cases. It is not yet possible to compare the results of the one with the other. The former is often performed in unsuitable surroundings (and perhaps on unsuitable occasions) by many men who make no claim to being specialists: the latter has been performed so far, only by specialists who have suitable operating theatres, etc., at their disposal: nor has the lower segment operation been in wide use long enough to collect complete figures of rupture of the scar. De Lee(9) states that "not more than 12 cases of uterine rupture after the low Cæsarean have been reported up to date" (i.e., end of 1926) and believes that the performance of low section more generally, would reduce the incidence of uterine rupture to less than one-tenth of what it is.

Two objections to the lower uterine segment operation that I have found are:—(*a*) one cannot sterilize the patient and (*b*) preserving the uterus in a septic case may mean the death of the patient from puerperal sepsis after some time. It is my belief, therefore, that if the patient is frankly septic, (i.e., with a raised temperature and an offensive discharge) or in a doubtful case if she has had several children, or if she is suffering from osteomalacia, the wisest plan is to do a Cæsarean hysterectomy, which is what may be called Type 3. I have never regretted doing it. The technique is briefly as follows:—

III. CÆSAREAN HYSTERECTOMY.

Carefully sterilize the vagina. After opening the abdomen, very carefully pack off the area of the uterus which it is proposed to incise. Open the uterus as for the classical section and deliver the baby. (If the baby is known to be dead, it should be left in the uterus which should be delivered unopened outside the abdominal cavity.) Carefully pack towels behind and around the uterus which is now delivered outside the abdomen. Leave the placenta in the uterus or push it into the vagina. Subtotal hysterectomy should now be performed or total hysterectomy if the os is widely dilated. The peritoneal cavity can be drained if it is considered necessary either through the lower angle of the wound or through the vagina.

I am convinced, furthermore, that this operation should entirely displace those dreadful operations of embryotomy where, in a series of very long and difficult manipulations, the fœtus is removed piecemeal through a contracted pelvis. The mortality of embryotomy is enormous and would be vastly diminished by substituting for it Cæsarean hysterectomy.

REFERENCES.

(1) *Jour. of Obst. and Gyne. of B. E.*, Vol. XXVIII.
(2) *Amer. Jour. of Obst. and Gyne.*, Sept., 1928.
(3) *Contracted Pelvis.* Fitzgibbon.
(4) *Moscher. Surg. Gyne. and Obst.*, Nov., 1927.
(5) *Amer. Jour. of Obst. and Gyne.*, Feb., 1927.
(6) *Amer. Jour. of Obst. and Gyne.*, Nov., 1926.
(7) *Amer. Jour. of Obst. and Gyne.*, Aug., 1928.
(8) *Ibid.*
(9) *Obstetrics and Gynæcology.* (Practical Medicine Series), 1927, pp. 169, 214.

SEVEN CASES OF DIAPHYSIAL ACLASIS (MULTIPLE EXOSTOSIS) IN INDIANS, INCLUDING FOUR CASES FROM ONE FAMILY.

By H. STOTT, M.D., M.R.C.P., D.P.H.,
LIEUTENANT-COLONEL, I.M.S.,
Professor of Pathology and Physician,
and
RAGHUNANDAN LALL, M.B., B.S.,
Reader in Radiology, King George's Medical College, Lucknow, India.

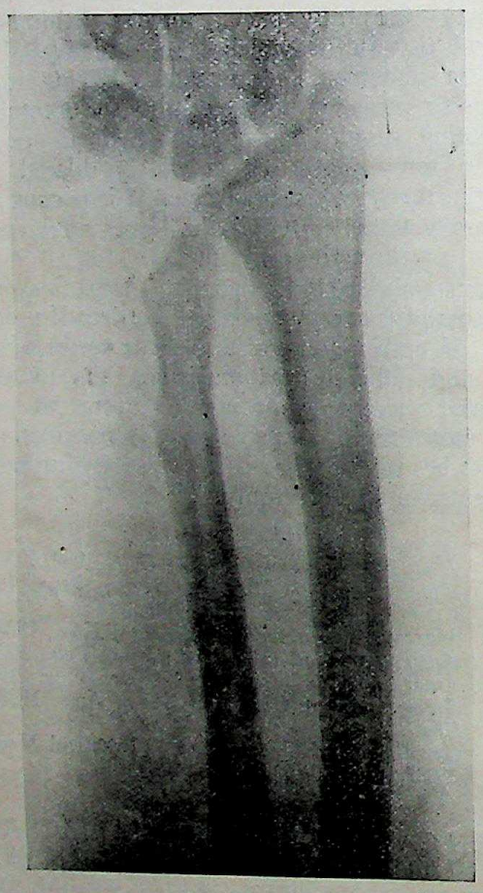
MULTIPLE exostosis (the diaphysial aclasis of Sir Arthur Keith) does not seem especially rare in Indians, but it appears that in all the London museums of pathology there is only one skeleton which illustrates this condition. Our attention

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

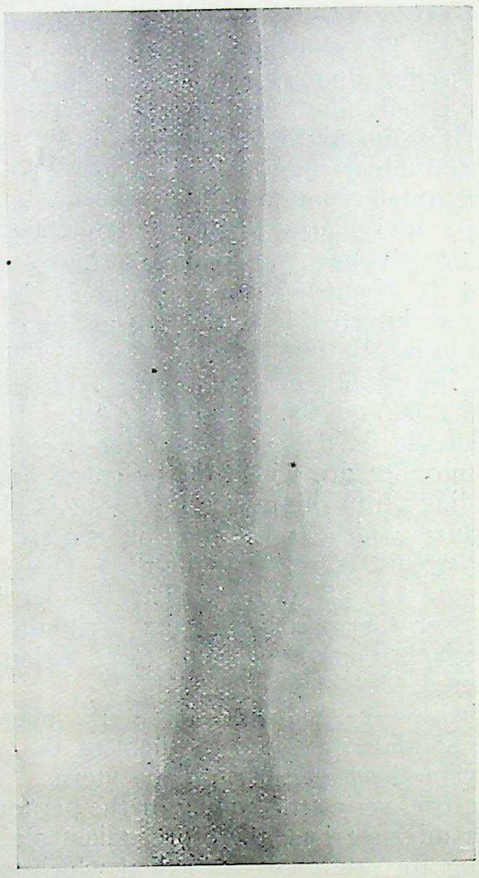
was first closely drawn to the disease by the admission into King George's Hospital of the patient whose history follows as Case 7. This patient died in hospital and we were fortunate in being able to obtain his skeleton for our museum. Plate I, fig. 1 shows the patient in life, Plate I, fig. 2 shows an X-ray photograph of his skeleton taken during life, and Plate I, fig. 3 his actual bones. A summary of what is known of the pathology of his condition follows the case description. Cases 1, 2, 3 and 4 are from a remarkable family of whom 9 were reported to be affected amongst 27 members. Case 5 was an old woman and case 6 a female child both without known family history.

Case No. 7.—The patient was a Hindu male of about 28 years, a Sadhu by caste and a non-vegetarian. He was admitted on 9th December, 1926, into King George's Hospital, Lucknow, for joint pains producing difficulty of movement during the past 2 months, also for breathlessness, cough and slight fever for 6 months. He died in hospital on 12th January, 1927.



Skiagram 2.

History.—His history was unreliable. He stated that the joints of the lower limbs and the right wrist had become swollen and painful after a dysentery attack two months previously. Before that he could walk and run like other men. He said he had had a penile sore and a penile discharge six months ago, that his father had had syphilis and that both parents died of cholera. He stated that he had not noticed the bony enlargements round his joints. None of his near relations had bony projections round these joints. He lived in Bilaspur until he was 12 years of age, in Ajudhia until he was 14, and in Hardwar until he was 21. None of these are endemic goitrous areas. He had never had a goitre.



Skiagram 2.
(Latest view.)

Condition on Admission.—Patient was thin and weak, weight 83 lbs. Height 5 ft. 3 inches. Chest (nipple level) 30 inches. Abdomen (umbilicus) 26 inches.

Locomotor System.—On examination the curious bony projections round both knee joints and ankle joints attracted immediate attention (*see* photo. 1). These projections gave the region of the knee joints an elongated appearance, and an apparent shortening and lateral curvature to both tibiæ. On closer examination, irregular projections from the upper and lower extremities of the tibia, fibula and femur on both sides could be made out, but the main enlargements were round the knee joints, that is, at the region of maximum growth of the leg bones. One projection, on each side, in the region of the adductor tubercle was especially marked. In the upper arm the expansion of the bony extremities was less but was again at the ends where growth was greatest, i.e., at the shoulder and wrist joints. The carpal, tarsal, metacarpal, metatarsal and phalangeal bones

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PLATE I.

Fig. 1.

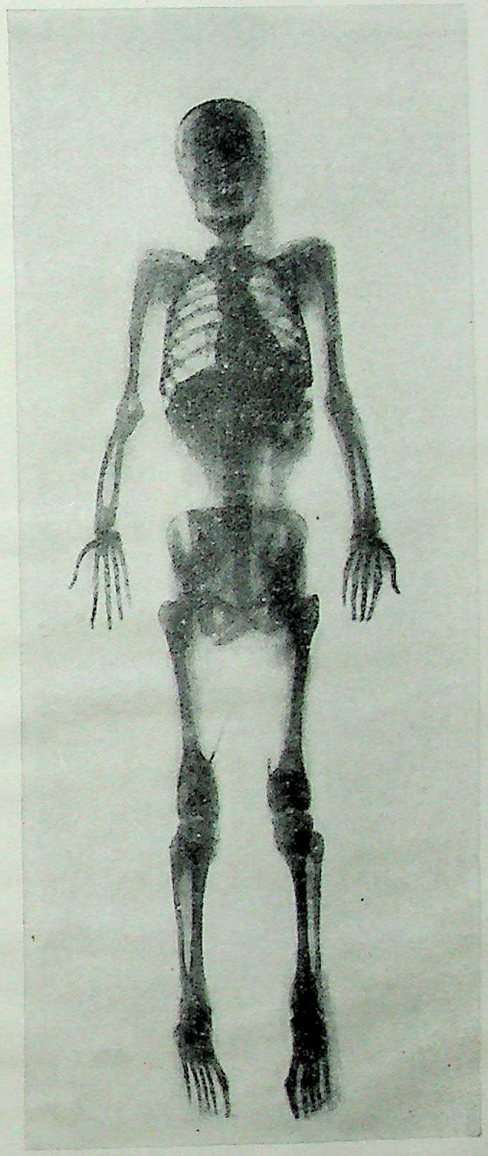


Fig. 2.

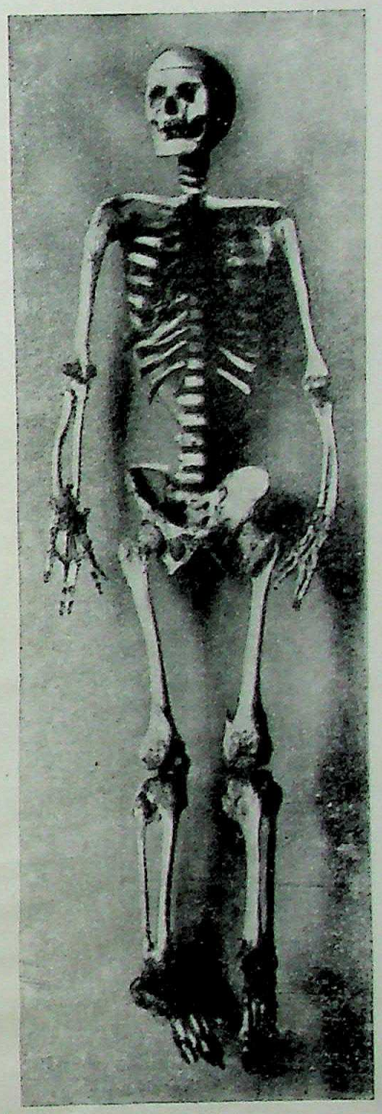


Fig. 3.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

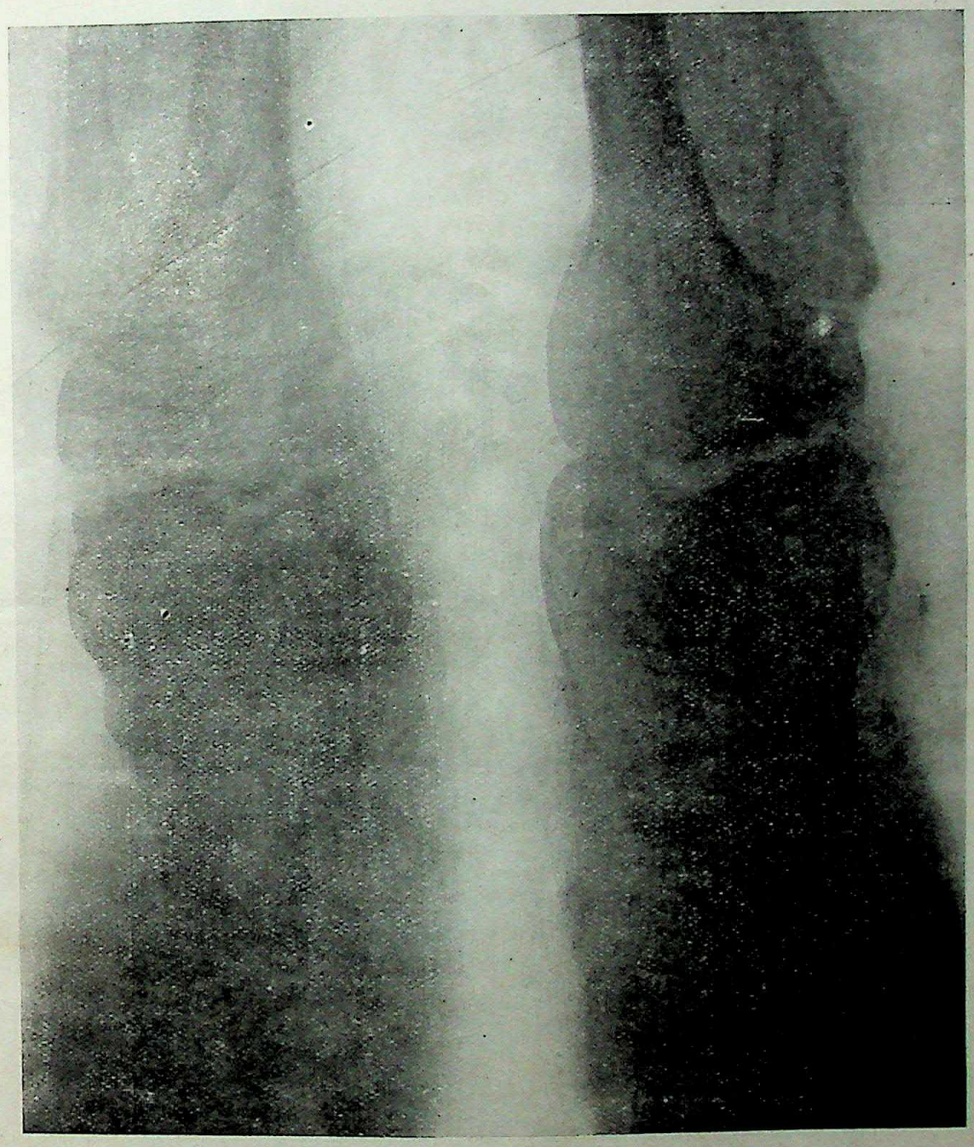
were in the main unaffected, but one or two bony nodules could be felt at the base of the metacarpals and metatarsals.

The pelvis seemed unaffected except for an obvious nodular lipping along the outer margin of each iliac crest. In the shoulder girdle a similar nodular lipping existed along the vertebral border of the scapula and to a less degree along the scapular spine. The coracoid process was enlarged on both sides. The bony wall of the chest showed two marked changes. The left tenth rib was markedly expanded throughout its whole length, and there were nodules where the costal cartilages joined the bony ribs giving the appearance and feel of a rickety rosary. The hand and face bones were unaffected, so also was the spine except that the posterior process of the 7th cervical and 1st dorsal vertebræ seemed unduly prominent.

None of these bony growths, of themselves, limited the joint movements but there was some slight swelling of the right ankle and to a more marked degree of the right wrist—which was considered to be of a totally independent nature either post dysenteric or possibly tuberculous. No urethral pus could be expressed and no gonococci were detected in the prostatic secretion. An average of several total blood counts worked out at 8,080 white cells per c.mm. with a differential count of 65 per cent. polymorphonuclears, 32 per cent. lymphocytes, 2 per cent. large mononuclear, and 1 per cent. eosinophile cells.

Respiratory System.—Both lungs showed signs of diffuse broncho-pneumonia, and tubercle bacilli were present in the sputum. There were no dull areas. The temperature showed an evening rise to 99° or 100°. On only one occasion did it rise beyond, to 102°.

Alimentary System.—Normal, except that the spleen was enlarged to four fingers below the costal margin, and was very hard in consistence. The enlargement was probably malarial though no parasites were found in the peripheral circulation.



Skiagram 1.

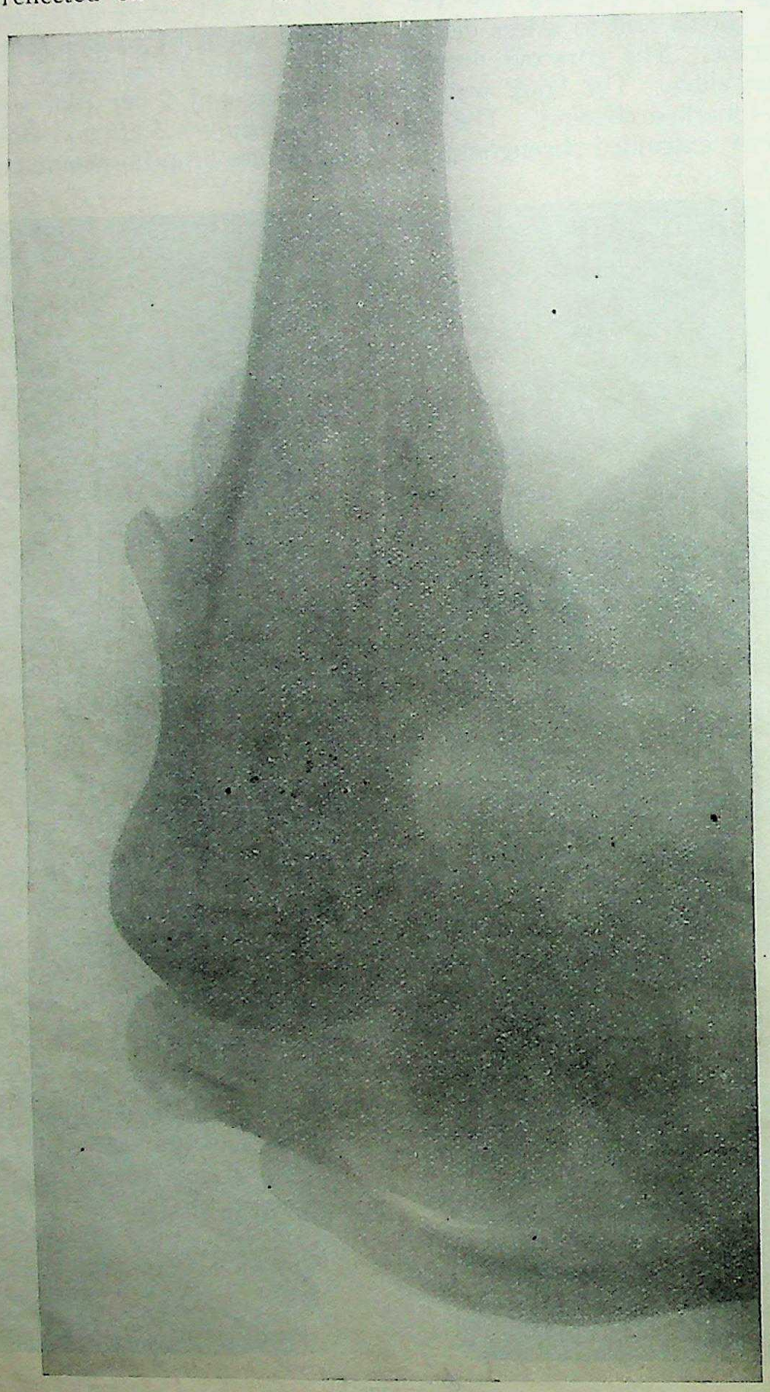
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Circulatory, Nervous and Endocrine Systems.—Showed no marked abnormality. He complained of night-blindness for past two months but no eye lesion could be detected by Dr. Acharya, Professor of Ophthalmology. The conjunctivæ of both eyes were reflected on to the eyeball from the lower lids and showed a very definite black pigmentary deposit, which was also present on the left upper and left lower gum margins as far as the middle line. There was no explanation of this pigmentation. No silver preparation had been used locally to the eye or internally. The thyroid showed no alteration in size. There were no signs of hyper or hypothyroidism.

Genito-Urinary System.—The urine was normal. The blood serum was positive to the Wassermann reaction, completely deviating 3 and 5 (but not 8) minimum hæmolytic doses of complement.

Progress.—The treatment adopted was for tuberculosis and syphilis, but the patient rapidly went downhill and died after some 5 weeks in hospital.



Skiagram 3.

Post-mortem.—Within two hours of death.

Alimentary System.—Nothing abnormal, except that the mesenteric glands were slightly enlarged and bright red. Liver weighed 53 ozs.

Excretory System.—Kidneys normal, each weighed 3.5 ozs.

Circulatory System.—Heart (6 ozs), valves and aorta normal.

Nervous System.—Normal. Brain weight 42 ozs.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Respiratory System.—Right pleura adherent over the upper lobe, left pleura adherent over the diaphragm. Right lung (12 ozs.) studded with tubercles. Left lung (14 ozs.) lower lobe studded with tubercles. Root glands—enlarged and caseous.

Hæmopoietic System.—Spleen 20.5 ozs. greatly enlarged and fibrotic. Capsule thickened.

Endocrine Glands.—Pancreas 3 ozs. Thyroid 25 grams. Thymus—could not be traced. Suprarenals—right 3.55 grams, left 2.55 grams. Pituitary—0.5 grams. Pineal—0.2 grams. Testicle—right 34 grams, left 21 grams.

Diagnosis and Notes.—The bony condition is typical of that formerly described as multiple exostosis or under the more modern name of "diaphysial aclasis." The condition is definitely removed from the category of bony tumours and is due to a growth disorder of cartilage, whereby the cancellous bone laid down between the diaphysis and epiphysis is imperfectly modelled by its lateral periosteal covering.

The shafts of long bones grow by two distinct processes.

(1) New cancellous bone is first laid down at the shaft extremities in the diaphysial line. Achondroplasia results when this process is defective.

(2) In the second or modelling process, this cancellous bone is absorbed and gradually converted into the compact shaft bone with its medullary cavity. In diaphysial aclasis all long bones exhibit one and the same defect, namely, arrest of the modelling process. Hence, in the several outgrowths of cancellous bone which arise, growth is vigorous and prolonged as this case well illustrates.

This disease does not arise in membranous bones (e.g., in the face bones or skull vault), nor in bones formed in cartilage (e.g., the sternum, vertebræ, skull bones, carpal and tarsal bones—and epiphyses of long bones), but, only in situations where the two processes of membranous and cartilaginous bone formation come into juxtaposition and especially, as in this case, where the modelling growth is most marked (e.g., at the diaphysial growing ends of long bones at the growing margins of the ilium and scapula, especially its vertebral border, the costochondral junctions and at both ends of the clavicle).

Skiagram 4.

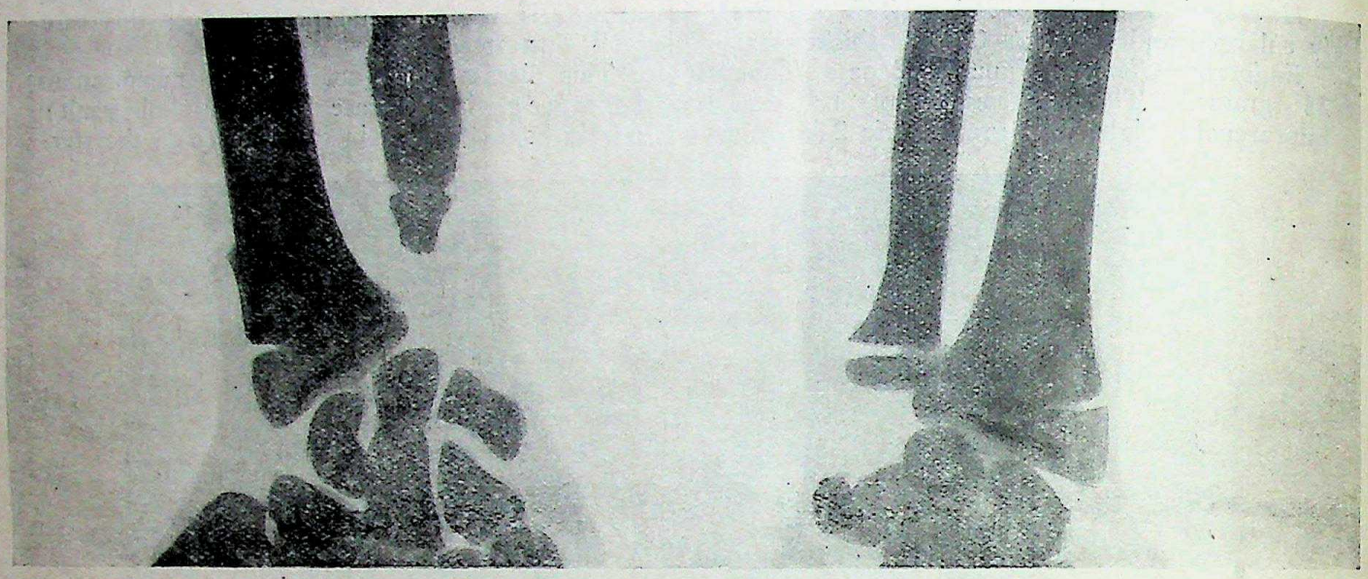
In the present case, X-rays show some abnormal periosteal deposit along the shaft of certain long bones. Bland Sutton states that the bones are often abnormally thick. The disease usually starts in childhood and ceases with skeletal growth—and the probability is that this is what occurred in this patient. The diaphysial ends of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

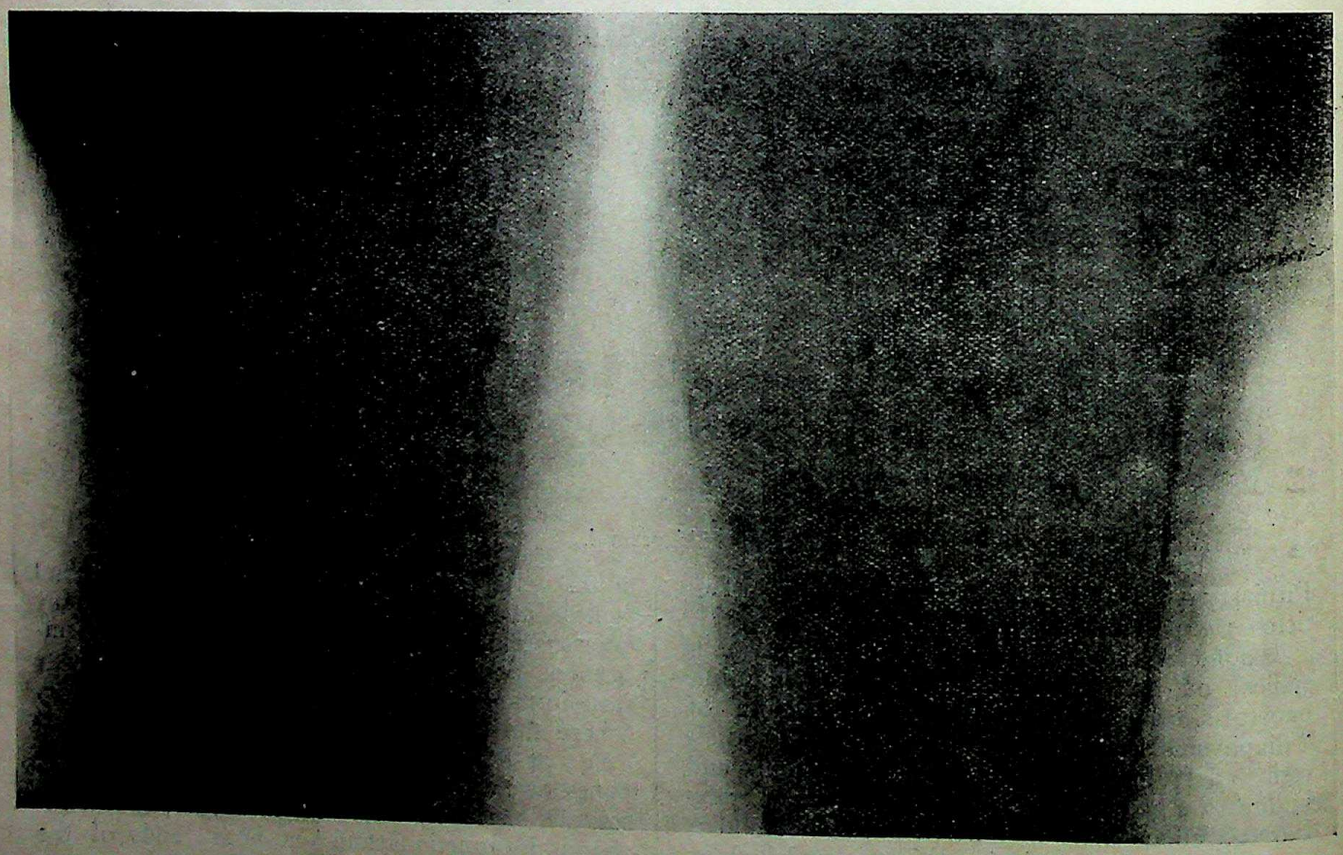
Digitized by Arya Samaj Foundation Chennai and eGangotri

the tibia and fibula are often fused as in this case. Also growth of the distal end of the ulna is deficient, whilst that at the distal end of the radius continues—whence the radius becomes "bent to form a bow," the ulna serving as a "stretched string." The proximal end of the radius is sometimes dislocated and the external epicondyle of the humerus detached.

Case No. 1.—Syed Jawad, a Madrasi male, aged 18 years, complained of bony growths around his knee, wrist, and shoulder, present since birth. These growths cause him no trouble. They have never been painful nor tender. He cycles comfortably and well. The tumours gradually enlarged in proportion to his body growth and have not been growing lately. No venereal history. Lymph glands, thyroid and spleen normal. All systems normal. Height 5 ft. 8 inches, chest at nipple level 30½ inches, weight 120 lbs.



Skiagram 5.



Skiagram 6.

Position of Bony Outgrowths.

(1) Around both knee joints especially at the lower ends of both femora with marked pro-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

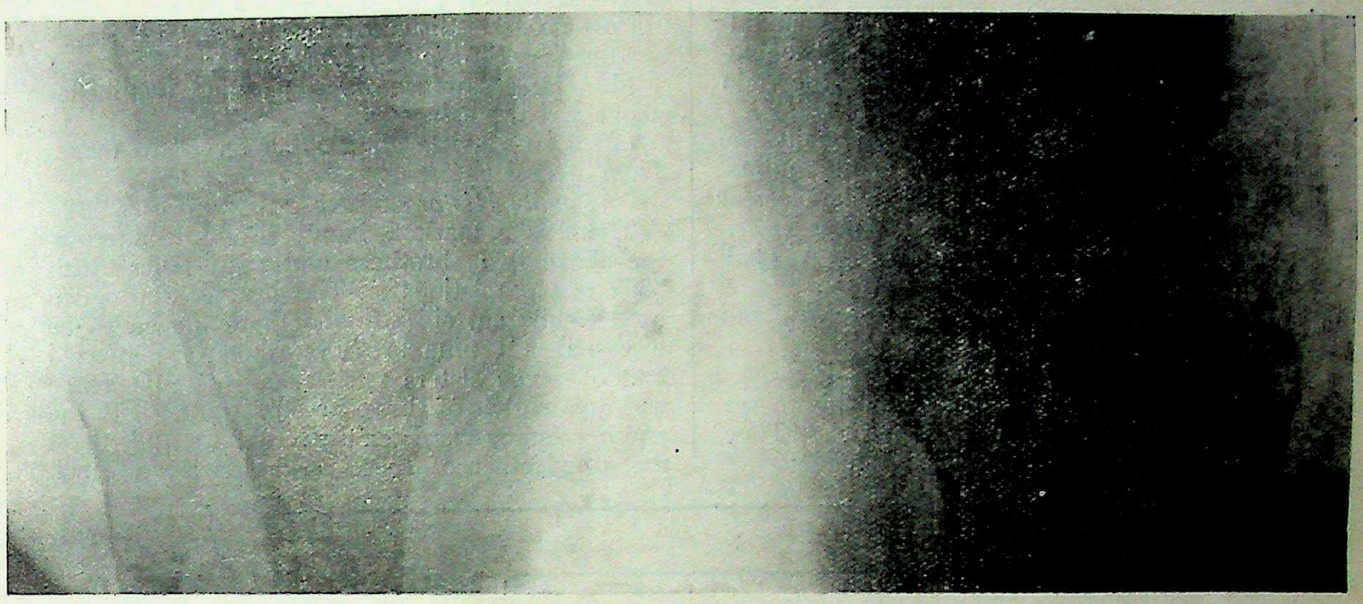
jections 2½ inches above the joint. Also expansion of upper end of both tibiæ and fibulæ (*see* Skiagram 1).

(2) At lower end of radius on the right side about 2 inches above the wrist (Skiagram 2 shows both lateral and antero-posterior views).

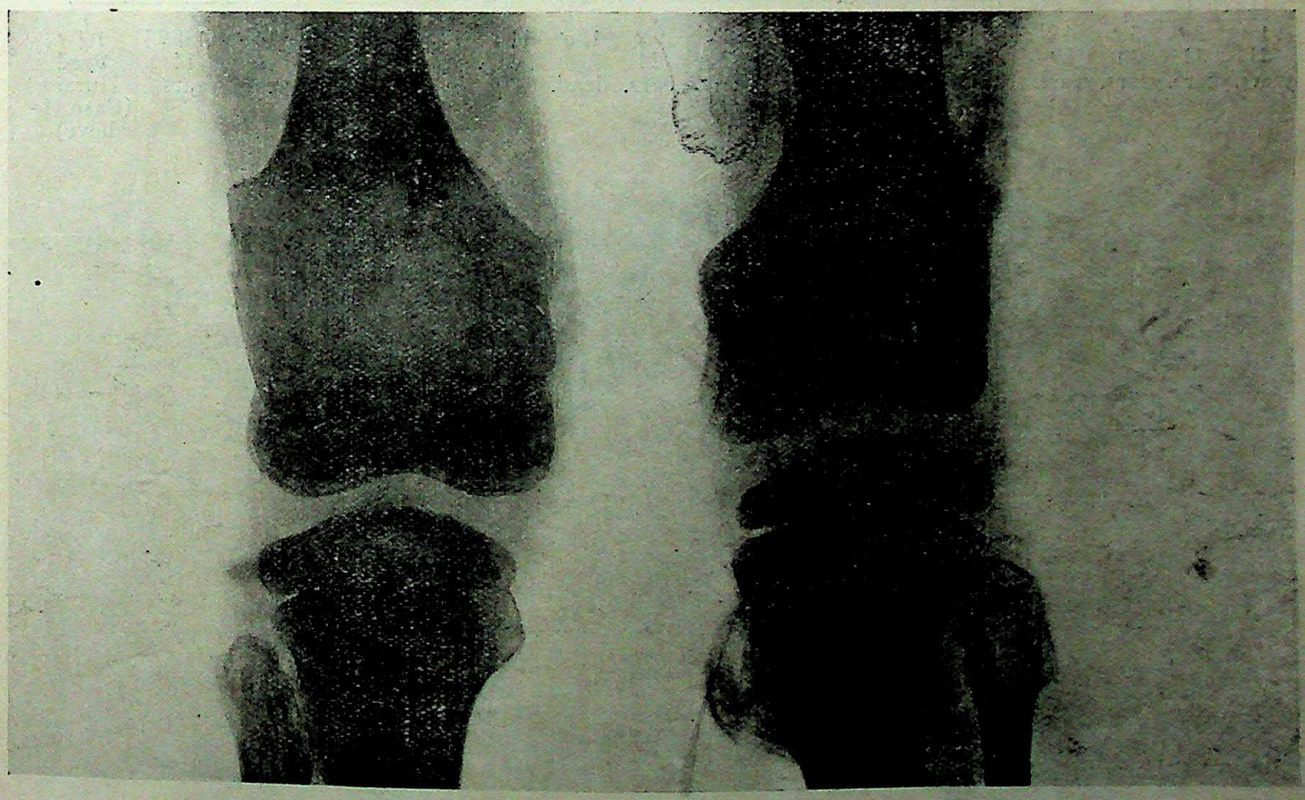
(3) At the proximal end of left humerus, just below its head (Skiagram 3).

(4) The lower half of the left border of the scapula shows marked thickening.

(5) The costo-chondral junction of the left sixth rib shows marked thickening, also less thickening at the right third costo-chondral junction.



Skiagram 7.



Skiagram 8.

The iliac crests, spine, skull and face bones, also the tarsal, metatarsal, carpal and metacarpal and phalangeal bones and phalanges appear free. So also are the ankle, hip and elbow joints.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Case No. 2.—Syed Husaid, brother of case 1. A school boy, aged 12. Duration of enlargements, since birth. No inconvenience.

Sites of Noted Enlargements.

(1) *Around both knee joints.*—Lower ends of both femora are enlarged and bony projections also arise from them, mesially as well as laterally, the latter being more prominent. The biggest outgrowth is at the upper end of the right tibia, but both tibia and fibula are affected.

(2) *Above both wrist joints.*—Especially on volar surface of radius one inch above joints. The lower end of left radius is also enlarged and the epiphysis is deformed (*see* Skiagram 5).

(3) *Below head of left humerus.*—A small nodular growth.

(4) *Sterno-costal junctions of 5th and 6th ribs.*—Small bony nodules.

Case No. 3.—Sister of Case 1, aged 28. Unmarried. We were ourselves unable to see this case and Case 4 owing to purdah. They were, however, examined by a lady student.

Position of Outgrowths.

(1) Dorsal surface of left radius, three inches above wrist.

(2) Seventh right rib, external surface, almond size, three inches from sternum.

(3) Right clavicle anterior surface, two inches from sternal end.

Case No. 4.—Sister of case 1, aged 14.

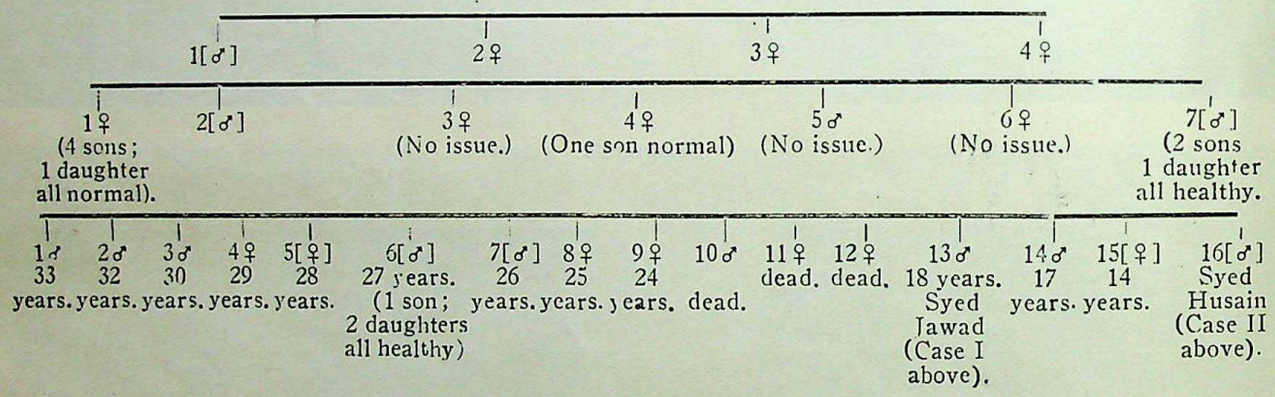
Position of Outgrowths.

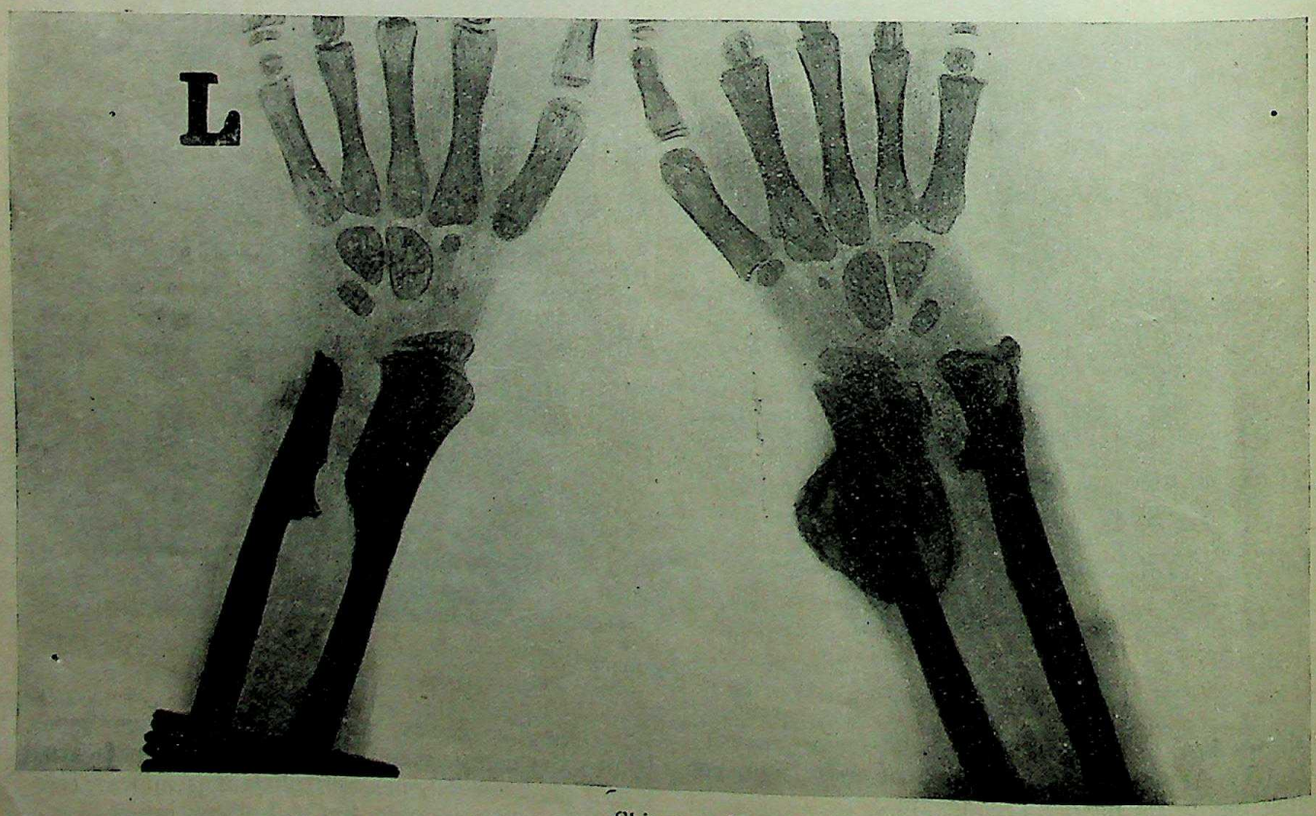
(1) Dorsal surface of right radius, two inches above wrist, small.

(2) Left clavicle anterior surface, two inches from sternal end.

Family History of Above Four Cases.

There is a marked family history connecting the above two brothers and two sisters with their near relations. The brothers are two of 16 children, six of whom are known to be diseased. Of nine brothers four were affected and of seven sisters two were affected. There was one mother of these 16 children and both she and her family were healthy. Both the father and the grandfather of these children were affected.





Skiagram 9.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In the father's family there were seven children, three males of whom two were affected, and four females none of whom were affected. There is no history of any other relations suffering from this trouble. The family state that a distant ancestor on his death-bed said that bony outgrowths would be a future characteristic of his family, and that this would be transmitted through his sons. The family tree is given on the previous page; diseased members are shown in squares.

Children Nos. 13 (Case 1), 16 (Case 2), 5 (Case 3) and 15 (Case 4) have already been described. There remain children 6 and 7. Child 6 is said to have bony outgrowths round both knees bigger even than those of case 1, but he can cycle without trouble. Child 7 has also big outgrowths round the knees. Possibly some of the children described as healthy have small outgrowths which would not be missed on medical and X-ray examination.

Case No. 5.—An old woman of 55 years, who came to hospital for gynæcological trouble. Large bony growths round both knee joints were noted (Skiagrams 6 and 7).

Case No. 6.—Sadika, a Mohammedan female child of 8 years, with hard lumps noticed at the age of one year on the left wrist and at the age of 7 round both knees. The wrist swelling was attributed to a fracture. All swellings have slowly increased in size but cause no discomfort. The patient is anæmic and thin but not emaciated. Height 2 ft. 11 inches. Weight 37 lbs. No evidence of congenital syphilis.

Family history.—Showed no similar condition amongst its members. Father and mother alive and healthy. Two brothers and one step brother, all healthy.

Position of Bony Lumps (Locomotor System).

1. *Shoulder joints*—upper ends of humerus on both sides are considerably thickened.

2. *Left scapula*—small nodule on vertebral border, just below spine.

3. *Both clavicles*—showed small nodules at acromial ends.

4. *Elbow joints*—small nodules on right olecranon process.

5. *Wrist joint*—big projection left radius—small ones of the right radius and both tibiæ. (*See* Skiagram 9).

6. *Hip joint*—right great trochanter slightly thickened.

7. *Hip bone*—small nodules on both iliac crests.

8. *Knee joints*—bony thickening on all sides of both joints (Skiagram 8).

9. *Ankle joints*—some nodules both sides.

10. *Hands and feet*—normal.

11. *Ribs*—small nodules about one inch from costo-chondral junction on 5, 6, 7, 8, and 10th left ribs and on 4, 5, and 6th right ribs.

12. *Sternum, vertebræ, skull and face bones*—unaffected.

No abnormality was found in the respiratory, circulatory, alimentary, nervous, endocrine or urogenital systems.

A NEW TEST FOR ALBUMIN IN URINE.

By CHUNILAL BOSE, C.I.E., I.S.O., M.B., F.C.S.,
Rasayanachariya,
(*Late Chemical Examiner to the Government of Bengal*).

THERE is considerable difference of opinion among experts as to which of the many tests employed for the detection of albumin in urine should be regarded as the most reliable one. It is hoped that the addition of the following new test to the list will be appreciated by the medical profession on the ground of its simplicity, delicacy and reliability. When it is remembered that none of the recognised tests is without its fallacies and that certain special advantages are obtainable from the employment of the new test, the writer thinks that a case has been made out for its publication.

The *reagent* used for the new test is *a saturated solution of saccharin in water* prepared by boiling saccharin in distilled water until no more saccharin is dissolved. Allowing the solution to cool, the next step is to filter it and preserve the clear solution in a stoppered phial. On standing for some time, a few crystals of saccharin may separate out and settle at the bottom; these may be allowed to remain.

The test may be performed in the same way as one does the Heller's test with nitric acid. It is best to take a long and narrow test tube, about one-sixth full of clear urine and held in a slanting position. Now slowly and carefully allow the reagent to run along the side of the test tube by means of a pipette; it will settle at the bottom. If albumin is present in the urine even in traces, a sharply defined white ring will slowly form at the junction of the two layers of fluids, best seen when held against a dark background, the ring does not disappear on the application of heat. Strong nitric and picric acids behave in a similar way with albumin in the urine and with regard to delicacy, all the three tests are probably of equal merit, but there are certain advantages which the saturated solution of saccharin possesses over the other

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tests and these are shown in the table below:—

TABLE I.

Substances experimented upon.	Reagents used.			
	Nitric acid (concentrated).	Acetic acid (ordinary).	Picric acid (saturated).	Saccharin solution (saturated).
Urine (nephritis)	Marked thick ring ..	No ring ..	Marked ring ..	Fine sharply defined white ring.
Urine containing mucin, and traces of albumin.	Two rings, one at the junction, the other at a higher level.	Cloudiness ..	A yellowish-white ring at the junction.	One sharply defined white ring at the junction.
Urine (hæmoglobinuria).	No ring at the junction; slight cloudiness at a higher level.	Slight haziness at the junction.	Marked ring at the junction.	A distinct sharply defined white ring slowly forms at the junction.
Urine containing slight excess of urea.	Heavy ring with crystalline deposit dissolved by heat.	Nil	Nil	Nil.
Urine containing slight excess of urates.	Diffused haziness ..	Nil	Nil	Nil.
Urine containing much excess of urates.	Thick cloud at the junction which nearly disappears on heating.	White precipitate	Yellowish-white precipitate.	A thin white ring at the junction, cleared on heating.
Blood plasma (very diluted).	Diffused cloudiness at the junction.	Nil	Large yellowish-white ring.	Distinct sharply defined whitish ring.
Peptone solution.*	Haziness at the junction	No cloudiness ..	Large yellowish-white thick precipitate not dissolved by heat.	Slight haziness at the junction.
Solution of egg albumin.	Distinct ring ..	Slight haziness	Distinct ring ..	Distinct ring.
Solution of urates (strong).	Copious white precipitate, disappears on heating.	Marked precipitate	Slight yellowish-white precipitate.	A whitish ring at the junction, dissolves on heating.
Solution of urea (strong).	Copious white crystalline precipitate, dissolves on heating.	Nil	Nil	Nil.

* Most probably the sample of peptone contained traces of albumin as an impurity.

It will be seen from the above table that the new reagent (saccharin) possesses certain advantages over nitric acid in that—

(1) It does not precipitate mucin.
(2) It does not precipitate urea.
(3) It does not precipitate urates unless these are present in the urine in considerable excess.

Besides, nitric acid is a strong corrosive liquid with a suffocating odour, leaves yellow stains on the fingers and for the busy medical practitioner is most inconvenient and dangerous to carry.

The *heat and acetic acid test* is certainly a very reliable one for albumin, but the presence of mucin in the urine complicates its application: this is easily got over by the use of saccharin solution which does not precipitate mucin. Moreover, acetic acid is a very pungent-smelling and irritant liquid and is not without risk so far as transport is concerned.

Picric acid is no doubt a very delicate test for albumin, but it precipitates other things as well, such as peptones, etc., which saccharin does not. Besides, picric acid leaves yellow stains on the fingers which are not easily removed by washing.

A saturated solution of saccharin is a perfectly harmless substance. It has no colour, no smell, has no caustic action on the skin and is non-toxic. It may be carried (if the stopper is well secured, and, better, if put in a "dropping" bottle) even in one's pocket for ready use at the bed-side of the patient.

Saccharin is prepared from *toluene* which is obtained from coal-tar naphtha by fractional distillation. Its chemical formula is $C_6H_4 \begin{matrix} CO \\ SO_2 \end{matrix} > NH$. It is a lcolourless crystalline substance, moderately soluble in water, possessing an intensely sweet taste and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is generally used as a substitute for sugar in the diet of diabetic patients. The composition of the compound it forms with albumin has not yet been worked out.

On a review of the literature on the subject, the writer has been unable to find anywhere the mention of *saccharin* as a reagent for testing albumin in urine.

The discovery of the new test was somewhat accidental, the attention of the writer having been first directed to the albumin-precipitating property of saccharin, while it was being used with milk as a sweetening agent.

The best thanks of the writer are due to Dr. J. P. Bose, M.B., F.C.S., Diabetes Research Scholar, School of Tropical Medicine, Calcutta, for permitting him to use the laboratory for conducting the experiments and to his assistants for help in the preparation of the reagents.

REPORT ON THE INVESTIGATION OF AN OUTBREAK OF EPIDEMIC DROPSY IN RANGOON IN THE YEAR 1924.

By K. R. DALAL, L.M. & S. (Bom.), D.T.M., D.P.H. (Liverpool),
Health Officer, Municipal Corporation of Rangoon.

THE following brief record of the observations made during the prevalence of an outbreak of epidemic dropsy in Rangoon in the year 1924 will be of interest to those studying the epidemiological aspects of the disease. So far as the city of Rangoon is concerned, this outbreak appears to be the first of its kind. My attention was first drawn to the prevalence of this disease by a correspondence that had appeared in one of the daily papers under the caption, "A new disease in Rangoon" in July 1924. A circular letter was addressed to all the medical practitioners and the hospital authorities drawing their attention to the incidence of cases of epidemic dropsy occurring in the town and requesting them to notify all cases that they might come across in their practice so as to enable me to carry out investigations into the cause and spread of the disease.

From personal enquiries made in the majority of the cases notified, I had come to the conclusion that these cases were evidently typical cases of what is usually described as epidemic dropsy in Bengal.

The total number of cases recorded during this outbreak was 174 of which 6 proved fatal giving a case mortality rate of 3.45 per cent. Of the cases reported, almost all the sufferers belonged to the Bengalee Hindu community except in two isolated instances where the sufferers were Upper India Hindus.

In the majority of instances, most of the adult members of the family had been attacked simultaneously one after another at very short intervals except in two cases where one member only of groups of ten and eight, respectively, living and messing together had suffered from this disease. On further enquiry it was ultimately found that the affected individual in one case used to take his meals with his brother's family at Kamayut which is a small village outside the city limits, where the whole of his brother's family had been down with this disease. In the second instance, the patient was primarily living at Okkyin village before he came to town where he developed the disease, but it was later ascertained that of the ten people who were living with him at Okkyin, four had developed the disease there also.

General History.—Some cases were very mild in nature, some rather severe with cardiac dilatation, dyspnœa and great debility. Of the total number, six proved fatal. In the majority, the attack started with some form of gastro-intestinal derangement marked by diarrhœa. In a few cases there was a history of passing blood. Febrile symptoms were mild with a daily small rise of temperature in the evenings. Pulse was rather rapid and the heart was found dilated in all cases of some severity. Urine was generally scanty with absence of albumen and sugar. There was complete absence of any nervous symptoms, knee-jerks being present but feeble in cases with marked œdema. The attack was usually ushered in with diarrhœa, soon followed by swelling of the legs and feet. Œdema generally affected the lower limbs as far as the hips. Only in a few cases, had dropsy extended to the upper regions of the body and face. There was no eruption of any kind beyond a general erythematous rash on the swollen parts. Sensations of heat, tingling or burning were felt in the swollen legs and feet. In the majority, anæmia and debility were marked symptoms. Dyspnœa was generally complained of. The onset of the disease was sudden and the incubation period appeared to be a short one. The following case of a servant newly employed in a household suffering from this disease is the only instance where the incubation period of this disease could be more or less definitely ascertained. The servant in this instance was engaged for the first time by the party after an outbreak of epidemic dropsy in his household, including his old servant who had to be sent to hospital. This newly engaged servant began to partake of the same food as had been cooked for the household and he developed symptoms of this disease for the first time exactly two weeks after his entry into this household.

The observations made during this epidemic reveal certain features of interest from the epidemiological point of view as given below.

(1) This outbreak of epidemic dropsy was the first of its kind in the city of Rangoon as far as records show.

(2) The outbreak was as sudden in its onset as in its subsidence. From the table giving a statement of the number of cases where a reliable history was obtained with their respective dates of attack, it will be seen that the outbreak started

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

in the first week of July 1924, reached its maximum in the third week of the same month and had practically come to an end by the middle of August.

(3) The incubation period as ascertained from the single case recorded above appears to be not longer than two weeks.

(4) Practically speaking this epidemic was confined entirely to the Bengalee community which forms a small part only of the Indian community of the population. The Census population of different communities in Rangoon is as follows:—

Christians	25,350
Hindus	125,626
Mohammedans	62,070
Buddhists	114,298
Other classes	18,161
Total ..	345,505

Not a single case of the disease occurred amongst the Burmese or the Indian Telugu communities who form the great bulk of the population and who use Burmese rice as their staple article of diet.

(5) There were any number of infants and children in the families who suffered from this disease, but not a single case was found amongst any infant or child taking milk diet only.

(6) The staple article of diet common to all the sufferers was rice which was, in every case except one, what is known as Calcutta parboiled rice.

(7) The rice purchased was mostly confined to shops owned by Bengalee merchants dealing in Calcutta rice.

(8) The only other common article of diet on which suspicion was cast was mustard oil which was used by all the sufferers for cooking purposes. This oil too is mostly imported from Calcutta. It is likely that a mixture of this oil with some other seeds containing poisonous ingredients may have given rise to this outbreak.

(9) There was no question whatever of the cause being due to any vitamin or other food factor deficiency as the sufferers were in the majority of cases well-to-do people.

(10) The general impression left on the mind at the time of the investigation was that the disease was due to some common infection or chemical poison or toxin from a particular consignment of rice or mustard oil imported from Calcutta and when that particular consignment had been disposed of all those who happened to consume from that lot suffered from this disease. This is the only theory that would account for the sudden outbreak of the epidemic, spread over different parts of the town, its equally sudden end within six weeks of its onset and its confinement to the one particular community which had a special predilection for Calcutta rice and mustard oil as essential factors in their daily diet.

Samples of rice collected from the houses of the sufferers and from shops which where the patients had purchased their rice supply were sent to Colonel Acton, the Director of the School of Tropical Medicine, Calcutta, who has reported the results of his examination stating that most of the samples sent were found to contain highly diseased rice grains. A few samples of mustard oil were also subjected to analysis but with negative results.

Some of the particulars, where a reliable history was available, are summarised in the following tables.

Table No. I.

Statement of the total number of cases of epidemic dropsy reported.

Within municipal limits ..	148
Outside municipal limits ..	26
Grand Total ..	174

Table No. II.

Statement giving the number of cases where their respective dates of attack were ascertained.

No. of cases.	Date of attack.
4 ..	4-7-24
7 ..	7-7-24
9 ..	8-7-24
8 ..	10-7-24
19 ..	18-7-24
3 ..	20-7-24
11 ..	22-7-24
7 ..	25-7-24
7 ..	26-7-24
7 ..	27-7-24
3 ..	29-7-24
7 ..	30-7-24
4 ..	31-7-24
1 ..	1-8-24
2 ..	2-8-24
2 ..	4-8-24
1 ..	8-8-24
1 ..	12-8-24
1 ..	15-8-24
Total .. 104	
No reliable history 44	
Outside municipal limits .. 26	
Grand Total .. 174	

Table No. III.

Statement of cases suffering from gastro-intestinal disorders.

	Diarrhœa.	Dysentery.	Piles.	No diarrhœa.	Grand Total.
No. of cases ..	87	5	5	7	104

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

078469

A Mirror of Hospital Practice.

AN INTERESTING CASE.

By T. S. DAKSHINAMURTHI, L.M.S.,
Sub-assistant Surgeon, Alipuram Jail, Bellary Cantonment, Bellary.

A WELL-BUILT convict Mopilla aged 45 years, sought admission into the jail hospital on 1st May, 1928, for the removal of two hard growths, one on the external aspect of either thigh at its lower end. The growths themselves were not painful but they interfered with the free movements of his legs, causing him pain and a certain degree of obstruction when he tried to assume a sitting posture from a standing one and *vice versa*. He noticed them as small nodules as early as the twelfth year of his age. He did not give any history of injury.

On examination, the man was noted to have pronounced genu valgum and flat feet. In the standing posture, a hard bony growth of a size and shape not unlike that of a patella could be seen and felt on the external aspect of each thigh 1 inch above the upper border of the patella and extending for about 2 inches along the outer margin of the quadriceps extensor. The growths were loose and so freely movable that they could be easily pushed under the quadriceps tendon and be distinctly felt on the inner side of the thigh. The right one was slightly bigger than the left.

The two bony growths were removed under chloroform by Dr. V. J. Lopez, I.M.D., the medical officer. Both the pieces were found enclosed in a thin sheath of connective tissue. They were loose, non-adherent and almost similar to an ordinary adult patella in size and shape. They showed several small pit-like depressions on their surfaces.

The chief interest in this case lies in its diagnosis which may be (1) traumatic myositis ossificans, (2) ossified chondromata, (3) cancellous osteomata (4) developmental anomaly, to wit, supernumerary patellæ. The following points are against myositis ossificans:—(*a*) Absence of history of any injury (*b*) complete absence of pain and stiffness in the muscles concerned (*c*) the symmetry of the growths.

In favour of developmental anomaly, to wit, supernumerary patellæ, there are:—

(*a*) The size and shape of the growths.

(*b*) Their situation close to the patellæ.

(*c*) The symmetry.

(*d*) Other congenital abnormalities, such as genu valgum and flat feet.

My respectful thanks are due to my Medical Officer, Lieut. M. R. W. Hart, M.B.E., M.R.C.S., L.R.C.P., I.M.D., who kindly permitted me to publish these notes.

POST-ENCEPHALITIC PARKINSONISM.

By FRANK NORONHA, M.B., C.M., D.P.M. (Eng.),
Superintendent, Mental Hospital, Bangalore.

THE term "extra-pyramidal" is applied to certain tracts in the central nervous system which conduct impulses downwards from the subcortical region of the brain. These tracts are normally under the control of the pyramidal system, and a functional combination of the two systems is necessary for normal voluntary activity. Any lesion in either of the systems leads, therefore, to a motor disturbance. A lesion in the pyramidal system in the neighbourhood of the internal capsule leads to post-hemiplegic rigidity and athetotic phenomena, due to unrestrained activity of the extra-pyramidal system.

But cases are met with where the signs referable to the extra-pyramidal system are found without any of the characteristic signs of a pyramidal lesion. These signs consist of disturbances of motility and those associated with changes in muscle tone, and are known as Parkinsonian, on account of their likeness to Parkinson's disease. These phenomena are also observed as a frequent sequela of epidemic encephalitis.

The following cases show the characteristic signs of an extra-pyramidal lesion in young adults and are probably post-encephalitic.

S., æt. 25, ryot, complains of stiffness of the body and inability to work. Duration of the disease is 3 years. It commenced with headache and excessive sleep for one year followed by tremors and stiffness of the body. He is physically well developed. Blood Wassermann test is negative and urine is healthy. Examination of the nervous system reveals a well marked hypertonicity of the whole body resulting in a bent attitude and fixity of expression (vide Fig. 1). Passive movements of the limbs are difficult and automatic associated movements are absent. Superficial and deep reflexes are normal and there are no pathological reflexes. Voluntary movements are slow and are interfered with by the rigidity and tremor. The tremors are in the extremities on both sides, in the upper eyelids and tongue and are increased on exertion. There is no sensory or vasomotor disturbance. The cerebro-spinal fluid shows increased pressure without any other pathological manifestation. There is no evidence of mental disorder.

The next case is similar, except that the signs are unilateral.

N., æt. 23, goldsmith by profession, has had the disease for 3 years. It commenced with fever for a month, followed by insomnia, mental dullness and general physical weakness. Then tremors of the left hand were noticed followed by tremors of other parts of the body. On examination, hypertonicity and tremor is found to be restricted to the trunk and extremities of the left side. Facial expression is maintained but

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the left angle of the mouth is slightly drawn up. The rigidity of the left side is noticed in the "drawing up" of the left shoulder and knee as

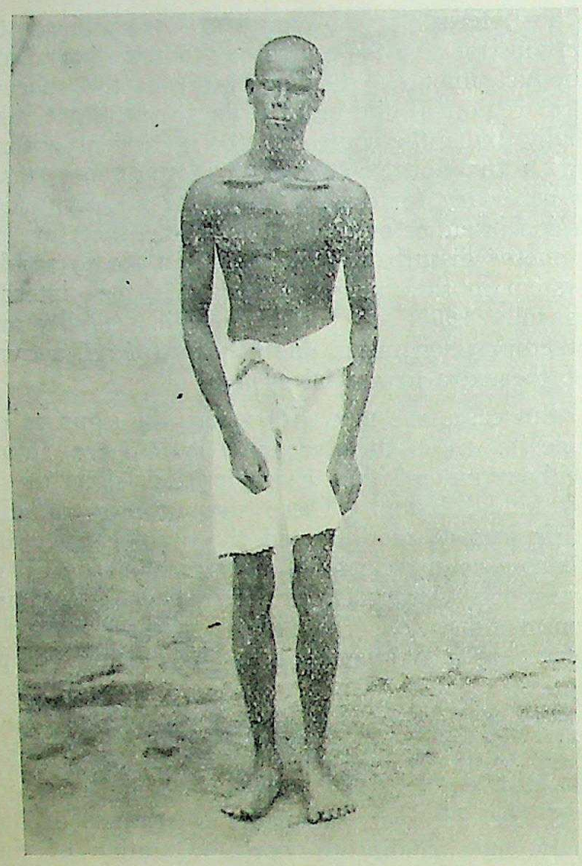


Fig. 1.

Post-encephalitic Parkinsonism characterised by rigidity, fixity of expression and tremor (bilateral).

compared with the right side. (Vide Fig. 2). He loses his equilibrium on slight extension of the trunk and falls backwards. Blood examination gives a negative Wassermann reaction and the cerebro spinal fluid shows increased pressure.

Patients with similar manifestations are frequently met with and on inquiry into their histories we find that the trouble could be traced back for a long period, of 3 years and more. Some of the patients trace their trouble to the first influenza epidemic in 1918. The initial fever is likely to be mistaken for influenza or typhoid.

Unlike a typical case of epidemic encephalitis, the abovementioned cases are free from oculomotor or other cranial nerve palsy, but the initial fever, accompanied by headache and lethargy or insomnia would lead one to class them as post-encephalitic Parkinsonism with lesions in the extra-pyramidal system.

In England there has been a gradual increase in the number of cases recorded annually, since the disease was made notifiable in 1919, and it would be useful to determine the extent to which this disease is prevalent in India.

Fig 2.

Post-encephalitic Parkinsonism. Unilateral (left side) rigidity and tremor.

A CASE OF AMYOTROPHIC LATERAL SCLEROSIS IN AN EAST INDIAN.

By V. C. RAMBO, M.D.,

Mungeli Area Christian Hospital and Dispensaries, Mungeli, Bilaspur District, C. P.

DURING a recent tour among the villages, of which there are nine hundred within a radius of thirty miles of Mungeli, Central Provinces, the writer visited the Patheria branch dispensary. Here was brought to him a case with such outstanding features that the diagnosis could not be mistaken as being any other than amyotrophic lateral sclerosis. The reason for this recognition was the vivid memory of a very close personal friend who died with this sad and hopeless disease while the writer was an interne in Philadelphia. Never having seen such a case in an East Indian, the case is presented herewith.

REPORT OF CASE.

History.—A man Dukhalu by name, Patheria dispensary case No. 1571, 56 years of age, a Chamar by caste, from the village of Charbhatta, was brought to the dispensary with the complaint of, "Dribbling of saliva and inability to speak or swallow." The patient's wife and friends gave the history of the disease and the patient assented, nodding his trunk and head together when questioned; he could not nod his head unless he

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

moved his trunk also, and made signs with difficulty. Six months ago, they said, the patient was the strongest man in the village. He could go any distance with a load and lift almost prodigious weights with ease in spite of his age. At this time, without any premonitory symptoms, his voice began to fail and swallowing became difficult. Within a month, his voice, formerly strong, was gone and he could not swallow his food without pushing it back into his throat with his thumb. His tongue became "useless" and small. At this time, saliva began to dribble from his mouth and has flowed from his mouth ever since. This has caused itching of his face which has added to his discomfort. With the onset of these symptoms every muscle of the body began to twitch. This became a constant annoyance and though there has never been any pain this twitching has been the cause of restless nights and comfortless days. As the days passed, the patient and his friends noticed loss of weight and a wasting away of muscles and marked weakness until even the lifting of his head and sitting up has become a great effort. There have been no symptoms referable to the digestive system except that he is not able to eat enough. No symptoms referable to the other systems have taken a part in this picture. There has been no fever at any time before or during this illness.

The past medical history throws no light on the subject. The patient has always been well and strong. There is no history of any illness except smallpox in childhood. Venereal disease is denied. (In the villages there is no compunction to the frank statement of the history of venereal disease if it has been present.)

He has had four children who together with his wife are living and well. There is no history of such a disease in his family.

The social history is interesting. The patient is a poor peasant farmer. He has never been allowed by his caste to eat red spinach, brinjal, masur dal, fish or any food cooked in cast-metal dishes, only food cooked in beaten-metal vessels is allowed. He is not allowed to smoke or use tobacco in any form. Two years ago, his caste advanced into the Hindu group and putting on the sacred thread he added to the restrictions that already bound him that of doing without meat of any kind.

Physical Examination.—Patient is a big-boned, well-developed, well-built man of about fifty-five or sixty years of age. He sits on his haunches with his shoulders stooped, his head bowed, his mouth open as though it were impossible to close it, and from it thick viscid saliva flows almost in a constant stream. His face is thin and has a mask-like expression. His body is emaciated and his skin hangs loosely as though he had recently lost weight. The spines of the scapulæ are prominent, the muscles of the scapulæ sharing in the manifest atrophy of all the voluntary muscles of the body. Fibrillary twitching of all voluntary muscles is present. The temperature, pulse and respirations are normal. The head, ears and nose present no abnormality. The right eye has a cataract. The left eye has an early cataract, but vision is still quite good. There is pallor of the conjunctivæ. The mouth is relaxed and wasted with weakness of the masseters. The gums are retracted but pyorrhœa is not marked and all the teeth are in a fair state of preservation. The tongue lies helplessly in the floor of the mouth fully 1.5 c.m. below the border of the lower teeth. The tongue cannot be protruded. Over the surface of the atrophied tongue, whose surface is thrown into folds, there are manifest multiple fibrillary contractions. These contractions present themselves in from four to a dozen places simultaneously. There is apparent atrophy of the pharyngeal muscles also, for the pharynx appears unusually large and roomy. The uvula cannot be raised. The neck and chest present no abnormality besides the muscular fibrillation and atrophy mentioned above. The heart has no murmurs or other adventitious sounds. At the time of the examination there were very few fibrillations present in the abdominal muscles. On speaking of this to the patient's wife she volunteered the information, that at times the fibrillation in this area was very marked.

The nervous system deserves special attention. All the coarser motor reflexes are definitely increased. The knee jerk, Achilles reflex, biceps, etc., are ++. There is marked weakness in all the muscles and all are easily fatigued. There is a slight rigidity of all muscles and they react sharply to percussion. The Babinski reaction is absent. No ankle clonus is present. The abdominal reflexes are absent. There is absolutely no sensory disturbance. The mind is clear and active. There is no tenderness manifest on ordinary pressure anywhere. There is no pain or aching, and no headache. The fibrillary twitchings mentioned above, are marked in all except the abdominal muscles, where they are present, but only after close observation are they seen.

Diagnosis:—

(1) Amyotrophic lateral sclerosis with early bulbar involvement.
(2) Pyorrhœa.
(3) Cataract.
(4) Secondary anæmia.
(5) Eczema from saliva dribbling over the cheek.

The diagnosis was made from the history of a progressive muscular atrophy with involvement of the bulb accompanied by fibrillation of the voluntary muscles, increased deep reflexes and paralysis, together with a lack of any sensory disturbance. No other disease gives this syndrome.

Prognosis.—There is constant danger from choking or from aspiration pneumonia. Even if one of these complications does not develop, respiratory paralysis, heart failure or starvation will not allow many more months of life.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Etiology.—This is not known. Exposure to damp and cold, various forms of poisoning, auto-intoxication and other causes have been mentioned. There is no proof that syphilis has any relationship to the disease. Did the atrophy in this case come from a sudden leaving off of all meat and eggs, the patient having partaken of a diet including such things for over fifty years?

Treatment.—This is empirical. There is no medicine that has any curative value. Considering the diet deficiency as a possible cause it would be illuminating to see what effect the new liver and vitamin treatment, given through a stomach tube, might have upon the disease. The completely degenerated cells could not be brought back to their function again, but the process might possibly be stopped. Neither the patient nor his family, however, can be prevailed upon to come where such a treatment might be given nor to break his caste bonds in order to take any such treatment.

Comments.—To the writer there are several features of interest in this case. In the first place he had never seen or heard of a case of the disease in an Indian. Another feature is the very rapid development of bulbar symptoms and the rapid progress of the disease. So rapid has been the extension that at the time of the examination the symptoms point to the fact that practically all the anterior and lateral pyramidal tracts including the sections in the spinal cord, medulla, pons, crus and possibly higher areas have become involved within the short space of six months. And, lastly, as mentioned above, there is the possible causative factor of a deficiency in diet at a time when the body was not able to make adjustments. This adjustment might possibly have been made had the patient been younger.

In these days we naturally refer all our unanswered queries to vitamin-deficiency for our answer.

NERVE ABSCESS IN LEPROSY.

By JOHN LOWE, M.B., Ch.B.,

Leper Hospital, Dichpali, Nizam's Govt. State Ry.

MUIR (1924) has recorded the occurrence of nerve abscess in leprosy. We have investigated this condition and our findings are as follows:—

Incidence.—In about 1,000 cases of leprosy of all kinds we have found nerve abscesses in 19 patients.

Nerves affected.—The commonest nerve to be affected is the ulnar nerve, 14 cases; the next commonest, the internal cutaneous nerve of the forearm, 3 cases; the median nerve, 1 case; the radial nerve, 1 case. We have never found a nerve abscess except in the arm.

The nature of the abscess varies somewhat according to the nerve affected:—

In the ulnar nerve.—In 8 cases there was a thickening of the nerve, sometimes very marked. In some cases the nerve was found as thick as the little finger. The swelling usually affects the nerve for three or four inches above the elbow. When the nerve is exposed it is found adherent to the neighbouring tissues and when the nerve sheath is incised the abscess is found beneath the epineurium and between the nerve bundles. The abscess is sometimes localized to one place but at other times spreads up and down the nerve for a distance of two or three inches. Sometimes there may be two small abscesses an inch or two apart with a small sinus connecting the two.

The abscess usually contains white cheesy semi-solid matter. When examined microscopically, leucocytes, lymphocytes, and "lepra" cells are found. A few lepra bacilli are usually found, some in "lepra" cells and some lying free. These are usually short forms, only about 2 or 3 μ long, and may be degenerated or dead.

In six cases of abscess of the ulnar nerve a different condition was found. Here the nerve was not markedly thickened and in connection with the nerve, but slightly removed from it, there was found a swelling varying from the size of a pea to that of a pigeon's egg. This swelling was usually well defined and capsulated and not adherent to the skin, but in one or two cases the swelling was diffuse and had no definite margin and in one case the abscess was about to burst through the skin.

At operation these swellings were found to be abscesses containing cheesy matter as already described, enclosed in a fibrous tissue capsule and having a narrow neck with a sinus passing through the sheath of the nerve to the interior of the nerve. This condition had apparently been brought about by the formation of an abscess inside the nerve sheath, the abscess bursting outwards through the sheath forming an encapsulated swelling outside the nerve, instead of spreading up and down the nerve as in the other 8 cases. Hence the less marked swelling of the nerve itself.

In the radial nerve.—In one case a similar abscess was found outside the nerve.

In the internal cutaneous nerve of the forearm other forms of nerve abscess were found in 3 cases. Here the abscesses have been small and in every case multiple. In one recent case five different abscesses quite small and with no apparent connections between them were found at intervals of about two inches along the nerve from elbow to wrist. This is exceptional. The two other cases have each shown two abscesses, in one case connected by a sinus running inside the sheath, in the other case separate. Some of the abscesses were confined inside the nerve sheath, some had burst out into the subcutaneous tissue.

The median nerve.—In one case a double abscess was found situated just above the elbow, both abscesses being inside the sheath and joined by a sinus.

Symptoms and signs of nerve abscess.—These are an exaggeration of the previously existing signs of nerve leprosy. In many cases there is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

marked swelling of the nerve, extreme tenderness, severe neuritis, increase in anæsthesia, and contraction of fingers. These symptoms are most marked in those cases where the abscess is confined inside the nerve sheath as the pressure exerted by the abscess is severe. When the abscess bursts through the nerve sheath these symptoms are much less as the pressure is reduced.

Sometimes there is a definite fluctuating swelling but this is usually found only in those cases where the abscess is outside the nerve sheath.

Causes of nerve abscess.—The formation of the abscess often appears to be associated with the occurrence of leprous reaction. A patient gets a nerve reaction and a swelling forms on the nerve, which diminishes when the reaction subsides but does not entirely disappear. A few weeks later another reaction occurs and the swelling increases, and with subsequent reactions an abscess is formed. It is noticeable that nerve abscess has been more frequent in those patients who are receiving potassium iodide-antimony treatment for leprosy. This is apparently due to leprous reaction caused by this treatment.

It is also noticeable that nerve abscess is often associated with the milder form of the disease where the infection is slight and the patient's resistance is comparatively high. In three cases the disease was apparently confined to the one ulnar nerve and the only symptoms present were those due to this nerve involvement. In six cases there were more general nerve symptoms but no lepra bacilli were found apart from those found in the nerve abscess. In the other ten cases there were some slight signs of skin leprosy but the predominating lesions were nerve lesions. In our experience the formation of nerve abscess, though troublesome in itself, is associated with a high degree of resistance of the patient and so is not an unfavourable sign with regard to the disease.

Treatment of nerve abscess.—In every case where nerve abscess is suspected, the nerve should be exposed and the sheath incised. If an abscess is found it should be scraped out with care to avoid damage to the nerve tissue. Drainage after the operation we have found unnecessary except in one case where the abscess was large and about to burst through the skin.

On operation, whether an abscess is found or not, the nerve sheath should be incised over the whole area of thickening, the nerve should be freed from all pressure especially in the ulnar nerve between the olecranon and the internal condyle of the humerus. Operation in these cases relieves pain, which may be very severe, and undoubtedly often prevents the development of contraction of the fingers and trophic lesions.

Prevention of nerve abscess.—In cases receiving potassium iodide treatment, great care must be exercised in regulating the dosage so that only mild reactions are produced. If nerve reactions are severe they should be controlled by injections of adrenalin subcutaneously and of 0.02 gram of potassium antimony tartrate intravenously.

Dr. Muir has recently suggested to us the oral administration of "Ephedrin" to control nerve reactions. In patients subject to nerve reactions this may be given at the same time as or shortly after the potassium iodide and the nerve reactions can thus be prevented or rendered much less severe.

REFERENCE.

Muir (E.), 1924. Nerve abscess in leprosy. *Ind. Med. Gaz.*, Vol. 59, No. 2.

AN INTERESTING CASE OF MELÆNA AND HÆMATEMESIS IN A NEWLY-BORN BABY.

By S. C. SEN GUPTA, L.M.F.,
Resident Medical Officer, Lakhipara Tea Estate, Banerhat P. O., Jalpaiguri District.

A HINDU girl, aged about 19 years (secundipara) was delivered of a male child on 4th December, 1927, at 7-30 p.m. Both the mother and the child were well on 5th December, 1927. But on 6th December, 1927, at about 9-30 a.m., when I was away on duty, I was informed by a maid-servant that the newly-born child was vomiting pure blood. I then hurried to the place and saw that the child was lying quietly on the mother's lap in a pool of blood. At this sight I was puzzled for a moment and could not ascertain its cause.

On examining the child I found the following state of affairs:—

Pulse	Fair.
Respiration	Normal.
Temperature	Normal.
Abdomen	Not markedly distended.
Cut end of the umbilical cord	Satisfactory.
Anus	Satisfactory.
Urinary meatus seemed to be plugged with mucus.	

History of no passing of urine since birth and of muddy stool passed once or twice.

No other abnormality could be detected.

Previous History.—First issue was normal. The first child is still living in sound health.

Finding no other alternative I simply gave one drop of adrenalin chloride solution (1 in 1,000) with a teaspoonful of milk by mouth. The mother of the child gave that milk to the child in my presence but the child at once vomited it out with about 1½ ozs. of blood, the colour of which was bright red. There was no clot of blood with the vomit but all along it was liquid blood and a little thick. The family did not like my giving an injection to such a young child. At 11 a.m. on the same day the child passed a dark red semi-liquid stool, quantity about one ounce.

I then informed one of my colleagues and he came but was unable to suggest any other line of treatment. He simply passed a sterilized needle through the urinary meatus to see whether

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

it was alright. Again at 1 p.m. I tried one drop of adrenalin chloride with milk but failed. As before it was vomited out and more blood gushed out from the mouth. I then simply told the mother to keep the baby warm and perfectly at rest. On the same day the child vomited blood twice more and passed a dark red stool once more. On 7th December, 1927, the child again vomited blood twice though at longer intervals and passed a dark red stool twice, once in the morning and another at night. The child since the onset of this trouble showed marked paleness though the pulse was comparatively fair. On 8th December, 1927 and 9th December, 1927, no vomit or stool occurred; 6 teaspoonfuls of milk and 12 teaspoonfuls of boiled water and one grain of sodi citras twice a day were given to the child. On 10th December, 1927 at 7 a.m. the child passed a stool naturally, the colour of which was yellow, quantity about ½ oz., consistency sticky, semi-liquid and acid odour. On gradual adjustment of feeding the child was all right and since then he has been doing well.

The special feature in this case is that the child did not show any other untoward symptom from the onset of the disease till recovery. A cure was produced by keeping the child warm and absolutely at rest, practically without any medicine. I have never previously come across such a case, nor have I heard of one. I think the child must have swallowed some of the mother's blood at the time of birth and that blood came out as melæna and hæmatemesis. If the blood in question had come from the child itself there would have been at least some change of pulse and respiration which there was not in this particular case.

A CASE OF ACHOLURIC JAUNDICE.

By M. L. KAMATH,

and

P. KUTUMBIAH,

Headquarters Hospital, Vizagapatam.

APPALASWAMY, male, Hindu, 20 years, agricultural labourer, admitted on 9th February, 1928, with jaundice, swelling of the body and breathlessness. Family history: negative. Has been suffering from fever with chills off and on for the past three years (?)

Physical Examination.—Conjunctivæ, yellow. Face and body, puffy (puffiness disappeared in a week). Anæmic. Both parotids swollen (swelling improved considerably in about a fortnight). Spleen 3 inches below costal margin in mid-clavicular line and just to the right of middle line in front. Liver just palpable. Nothing particular regarding lungs and nervous system.

Pulse varied from 72 to 96 per minute during his stay in hospital. Slight hæmic bruit. Blood pressure, 120|50. R.B.C., 1,070,000. W.B.C., 3,750. Colour index, 1. Differential count, Poly., 33 per cent. Small lymphs., 17 per cent. Large lymphs., 41 per cent. Large hyaline, 8 per cent. Eosinophile, 0.25 and mast cells 0.75 per cent.

Hæmolysis begins with 0.55 per cent. saline and is complete with 0.4 per cent. Repeated a week later with similar result.

Van Den Bergh Direct negative; Indirect positive. Quantitative 5.2 units. Cholesterol 76 mgms.

Urine Sp. gr. 1012, acid. No albumin, sugar or bile. Urobilinogen present in large quantity.

Blood Wassermann, weak positive. Repeated examination of blood for malarial parasites was negative. Fever came down without any quinine being given.

Patient left hospital on 16th March, 1928, in the same condition (except for the puffiness and improvement of the swelling).

A CASE OF FOREIGN BODY IN THE VAGINA.

By BINODE KRISHNA BANERJI, M.B.,

S. C. Coomar Charitable Dispensary, Chanditala, Hooghly.

A GIRL of about 15 years was brought to the dispensary by the police in a *palki* from a distance of about 6 miles with a history of having been ravished and a foreign body forcibly introduced into the vagina about 48 hours previously. At first the local doctors tried but failed to extract it.

She entered the room with a limping gait and a dirty discharge with a very bad smell was noticed coming trickling down the thighs. A hot vaginal douche was given at once and on examination a hard substance was felt inside the vagina with the surrounding parts swollen and tender, so much so that there was hardly any room left for the passage of a solution.

At first attempts were made to extract the foreign body by means of a pair of forceps but the surrounding parts held it firmly and the tenderness prevented any further manipulation. She was put under chloroform when the parts relaxed and a finger, forcibly introduced by the side of the foreign body (which was found to be a tin box with the lid in the upper aspect of the vagina), hooked it out together with a profuse discharge of blood-streaked pus. The tin box was cylindrical in shape—1¾ inches long with a diameter above 1 inch—and contained *gul* (a preparation of powder, black in colour, taken by the ladies of the lower classes). A hot vaginal douche was given again and the patient made an uneventful recovery within a few days.

It is very difficult to say whether the injury was self-inflicted or not, but the plight in which the patient was received in the dispensary suggested that the box might have been forcibly introduced by somebody.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail).

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones. The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.

Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THE MENOPAUSE.

Two gland products of outstanding merit are offered by the Anglo-French Drug Co., for the treatment of Menopause troubles.

Opocrin Ovaro-Thyroid

Ext. Thyroid 3 cgm.
Ext. Ovarian 12 cgm.

Per bottle of tablets @ Rs. 3

Opocrin Ovaro Pituitary

Ext. Pituitary (total) 5 cgm.
Ext. Ovarian 10 cgm.

Per bottle of tablets @ Rs. 3

Dose Four to Eight "Opocrins" daily.

"OPOCRINS"

Superior Gland Products

ONE GRAMME CREOSAL CONTAINS

Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

For COUGHS whatever their origin

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

Send 8 As. stamps "for large sample bottle."

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY. Telegrams: P. O. Box 7861, CALCUTTA.
P. O. Box 226, MADRAS. "AMPSALVAS." P. O. Box 134, RANGOON.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

JANUARY.

A MEDICAL COUNCIL IN INDIA.

IN our July issue we dealt at considerable length with the Bill then pending before the Bengal Legislative Council to amend the Bengal Medical Act and with the criticisms of the Bill put forward by the Bengal Medical Association. We pointed out that the functions of the Bengal Council of Medical Registration, like those of the General Medical Council of Great Britain, fell into three categories:—(1) to maintain the medical register, (2) to decide what titles or qualifications granted by universities or other examining bodies shall entitle a practitioner to registration, to regulate standards of examination and to inspect medical colleges and schools in order to enable the Council to judge of the efficiency of the instruction imparted therein, and, (3) to remove the names of registered practitioners from the register under the conditions laid down in Section 25. It is obvious that the most important functions of the Council are those comprised in the second of these divisions, the regulation of medical education, which can only be properly carried out by a body composed mainly of experts in medical education, an objective best secured by a constitution similar to that of the General Medical Council of Great Britain. Such a constitution as that proposed by the Bengal Medical Association with a majority of elected representatives of the general profession and with the educationists in a minority would completely fail to secure the object aimed at. However, the Government Bill with some minor amendments was passed, so, for the present, the question, as it affects the government of the local medical profession in Bengal, is set at rest.

We now have to consider a proposed All-India Bill "to establish a Medical Council in India and to provide for the maintenance of a British Indian Medical Register," the text of which being confidential for the present we are unable to publish. At a meeting of the Bengal Medical Association held on 30th July, the Bill was referred to a committee for discussion and the report of their deliberations is published in this issue. Before we deal with their observations, we shall invite attention to some points dealt with in a most interesting covering letter from the Department of Education, Health and Lands of the Government of India, which appears to us to put the case for an All-India Medical Council as clearly as it could be put.

The Government of India have twice in the last 8 years examined the question of setting up in India a central organisation to regulate standards of qualification in Western medicine and have hitherto decided against the proposal partly on financial grounds, and partly because medical administration is a transferred subject under the reforms. From the recent history of the relations between medical faculties in India and the General Medical Council, the Government of India have come to the conclusion that the time has come to reconsider their former decision. The recognition secured by the majority of the Indian universities from the General Medical Council has been of a temporary nature, extended for periods of six months or a year as a result of inspections carried out by an expert on behalf of the Council. The authorities concerned in India have been embarrassed by the necessity of dealing with a body whose headquarters are six thousand miles away, whilst the General Medical Council has felt the difficulty of discharging its statutory duty of satisfying itself of the quality of instruction and examination in medical colleges and universities in India by "periodic visitation and inspection" through its own agency. The President of the General Medical Council stated in his recent opening address that it was no longer practicable to carry out these inspections through the direct agency of the Council. If these inspections cease, the recognitions at present accorded must lapse on the expiry of their present term; this would inflict great hardship on students from India proceeding to the United Kingdom for higher study. The alternative is to set up an authority in India which will, in regard to institutions teaching medicine in this country, perform the functions which are now performed by the General Medical Council in the United Kingdom and will negotiate with outside authorities, including the General Medical Council itself, the conditions of reciprocal registration of the medical qualifications recognised by each. The effect of this will be not to curtail the autonomy of educational institutions in India, but to make India autonomous in the regulation of her own standards of medical qualifications, and in the determination of the terms on which medical qualifications acquired abroad shall be recognised in India. The President of the General Medical Council has already expressed himself in favour of the setting up of some single authority in India with which the Council could communicate directly.

The present Bill has been drafted to some extent on the model of the Canada Medical Act, as in that country the provinces enjoy constitutional powers analogous to those possessed by the provinces in India in regard to transferred subjects. With regard to the composition of the Council, the provinces are given predominant representation and the majority of the members will be elected. We doubt whether it is wise to have such a high proportion of elected representatives of the private practitioners for the reasons given in our former editorial. The 30,000 medical practitioners on the British register are represented by only 6 members in a council of 42;

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

whereas in the present Bill each province sends one member elected by private practitioners, so that their representatives will constitute about one-third of the whole council. Much will depend on whether the profession elect teachers or politicians to represent them. Time alone will show how this privilege will be used. The electorate is restricted to those holding university qualifications.

The powers of the Council cover:—(1) the determination of the qualifications and conditions necessary for registration on the register for British India including scrutiny and approval of the course of study, (2) the employment and maintenance of medical inspectors and (3) the arranging and bringing into effect of any schemes of reciprocity with any British, colonial or foreign medical licensing body or authority. The main agency for determining the qualifications necessary for registration on the All-India register will be the medical inspectors. While the courses and curricula of universities will be subject to scrutiny in order to ensure that they are calculated to provide a satisfactory standard of proficiency in medicine and surgery, there will be no attempt to prescribe these. The initiative in this matter will as at present rest with the educational authorities directly concerned. Registration on the council's register will carry certain privileges, failure to secure such registration will impose certain disabilities.

It will be noted that no reference is made to the class known as licentiates. The Government of India are of opinion that the attainment of uniformity in standards should in the first instance be attempted only in relation to those who possess graduate qualifications. The Government of India hold the view that the standards of education and qualifications of medical licentiates should be levelled up throughout India; but that for the present provincial needs and conditions may render the immediate realisation of this ideal impracticable. A second gap in the Bill is the absence of any provision to define the relations of the central with provincial medical councils. The main functions and powers of provincial councils are:—

(1) To supervise and maintain the provincial register;

(2) To require particulars of their examinations from institutions included in or desirous of being included in the schedule to the provincial acts constituting the council and to demand that a member of the council deputed for the purpose shall be permitted to be present at any examination; and

(3) To refuse to register or direct the removal from the register of certain classes of persons.

If the view that the proposed All-India Council should first concern itself with graduates is accepted, provincial councils will retain and exercise all these powers in regard to licentiates. Functions (1) and (2) will, in respect of graduates, pass to the central council. Function (3) which relates to disciplinary power will, with reference to persons whose names are borne on the All-India register, also pass to the central council. The conditions for disqualification will be regulated by rules framed by the central council instead of by those laid down by the provincial acts. It would seem more convenient that disciplinary action should, in the first instance, be taken by provincial branches of the central council, appeals being heard by the latter or by a sub-committee of it. Minor changes in the provincial acts may be required to regulate the relations between the proposed central and existing provincial councils and to link those latter with the central council.

The necessity for an All-India Medical Council has long been apparent and the recent strained relations between the University of Calcutta and the General Medical Council of recent years have rendered the problem acute, by reason of the hardship inflicted on students desirous of prosecuting their studies in the United Kingdom. It is difficult to see any reasonable grounds on which objection can be taken to the objects of the Bill.

The report of the Committee of the Bengal Medical Association deals only with minor points arising mainly from failure to appreciate the main provision of the Bill, which is that it deals with graduates only and not with licentiates nor with practitioners of the indigenous systems of medicine. It is not proposed to supersede the provincial councils so far as licentiates are concerned, nor to tackle the difficult problem of standardising the examinations for the licentiateship of the different provincial medical faculties. We are inclined to think that this problem will eventually settle itself by the gradual approximation of the licentiate standard to that of the graduate, until the former merges into the latter and a uniform standard of qualification for all medical practitioners throughout India is attained. The present position should be looked on as a temporary expedient to meet the urgent need for medical aid in the rural areas of India and as merely a phase in medical education. The state of affairs in Great Britain fifty years ago was not so very different, with the "Hall," the "College" and the Universities representing three different standards of qualification and with the almost universal employment of unqualified assistants to treat the less important cases. The suspicious member of the Bengal Medical Association's Committee who sees in the phrase *British* Indian Medical Register an attempt on the part of the Government to throttle those who practise the indigenous systems of medicine should study Section 1, Sub-section 2 of the Bill, from which he will learn that the expression "British India" is merely a geographical term. No one questions the right of the Universities in India to determine the courses of study and to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

confer degrees, it is only when it comes to the right of the possessors of those degrees to practise medicine in any administrative area or country that the State steps in and claims the power to decide whether those degrees constitute a sufficient qualification. That this power should be exercised by provincial councils for licentiates, whose diploma is valid in India only and by a central council for graduates, who may thereby acquire recognition in countries outside India, is an equitable arrangement which we hope will be passed into law as soon as possible.

Current Topics.

Nasal Obstruction.

By PHILIP A. HARRY, M.D., D.P.H.

(*The Prescriber*, July, 1928, p. 229.)

Infants and Young Children.—All are agreed on the evil effects of insufficient nasal breathing, and the symptoms that arise, nasal, aural, and general, are well known. It is, however, not generally accepted that the structural changes leading to the production of the adenoid facies are due to nasal obstruction in early infancy. In the second dentition it is found that the nose and naso-pharynx have failed to undergo their full normal development. The upper jaw becomes narrow and pointed, the face is pinched, and the teeth are crowded, the incisors protruding and the bite open. This is the typical "rodent face,"—the English face of continental caricaturists. Other signs of secondary importance are the narrow slit-like nostrils; and the disappearance of the natural grooves and depressions between the nose, cheek, and upper lip. The nasal cavities also show irregularity in development; the septum which should be smooth and vertical becomes crumpled and grows unequally while the palate is deformed and becomes high-arched. Deformities in the chest-wall are also noticeable, the sides of the chest being flattened and the sternum projecting so as to produce the condition known as "pigeon breast." In other cases a shallow depression forms round the ribs and sternum corresponding to the insertion of the diaphragm. The skeletal changes in the face are due to the direct mechanical effect of the naso-pharyngeal obstruction, while those in the chest-wall are produced by the constant sucking-in efforts made during inspiration by the thoracic muscles in their attempt to overcome the obstruction within the nasal cavities. The persistence of defective nasal respiration will also produce the evil effects of confirmed mouth-breathing, such as loss of the natural resonance of the voice, which becomes dull and toneless. Snoring is persistent and loud, and the breathing is heavy even during the day. The sense of smell is impaired and the appreciation of flavour is not keen. By tilting up the tip of the nose the mucosa of each side can be compared; it will be usually pale, œdematous, sodden, and covered with an abnormal amount of mucus.

In young infants other causes of nasal obstruction, such as congenital occlusion of the nostrils, anterior and posterior, congenital syphilis, and mongolism, will produce the general symptoms but not the typical adenoid facies, which is caused by the mechanical effect of the naso-pharyngeal growth. The only cure for the latter condition is the complete removal of the obstruction; the lay opinion that an infant can be too young for operation or that the tender age of the child prohibits surgical interference must be exploded,—postponing the procedure will increase the facial deformity and render remote the chances of the child's proper growth.

In young infants the symptoms are inability to suckle properly; as soon as the mouth closes on the nipple the difficulty of breathing is apparent and the child has to let go in order to breathe. He also swallows air while trying to feed, this causes sickness and attacks of "wind"; indeed a frequent cause of flatulence in infants is enlargement of the naso-pharyngeal tonsil. This renders them more liable to digestive troubles and malnutrition. Nervous symptoms are more manifest, for example, laryngeal spasms, laryngismus stridulus, and various forms of suffocative attacks. Night-sweats, persistent cough, and other reflex symptoms are also noticed at this early period. Convulsions occur occasionally.

In these early months of the infant's life the post-nasal space is too small to allow of digital examination, and diagnosis must be made from the character of the obstruction and the history. The ordinary small-sized curette cannot be satisfactorily used, a small pair of adenoid scissors is more helpful, bearing in mind the fact that the posterior edge of the septum is more oblique than in the older child and that there is greater danger of injuring it.

Breast-fed infants are less liable to the development of adenoids than the bottle-fed. In congenital syphilitics a discharge from the nose is present in the majority of cases before the operation and is liable to persist even after the removal of the adenoids; it however, responds to suitable medical treatment.

The prevention of nasal obstruction in young children is important and can be achieved only by careful management. At this early age the mucous membrane of the nose and naso-pharynx is particularly susceptible to infection and the local resistance is very low. These infants should be protected from coming in contact with carriers of infection. The importance of breast-feeding cannot be over-emphasized.

Young Adults.—In young adults a disease of the nose that is occasionally met with is ozœna. The chief symptom of this complaint is nasal obstruction. The sensibility of the nasal mucous membrane is altered so that the normal sensation of air passing in and out of the nose is not felt; the presence of discharge and crusts in the nasal passages, together with the difficulty of blowing the nose, tends to foster the belief that the nose is blocked, although the passages are wider than normal. The diagnosis is rendered easy by the characteristic odour; there is no necrosis of bone, although an undoubted osseous atrophy exists.

Middle Life.—Nasal obstruction in middle life is due in the majority of cases to polypi, an inflammatory growth from the upper part of the nasal cavity. They are usually multiple, vary in size, and occur in both sides of the nose. The inferior turbinate bone is hardly ever the seat of polypus formation. The inflammation commences in the mucous membrane and extends to the underlying periosteum and bone. Any irritative condition of the mucous membrane of the nose or of the accessory sinuses will give rise to polypi; they are occasionally found in the frontal and sphenoidal sinuses and antrum. The diagnosis of the disease is not without difficulty; hypertrophy of the anterior ends of the inferior turbinates and septal deviations may be mistaken for polypi, but examination by transillumination and radiography will assist in making a decision.

The growth should be removed as close to its base as possible and any sinus disease treated afterwards. This is important, as a polypus may mask malignant disease of the nose, and it is only after removal that the firm, rough, bleeding and ulcerated surface of an epithelioma, or the soft friable mass of a sarcoma, can be discovered. Frequent attacks of epistaxis or repeated blood-staining of the nasal secretion should arouse suspicion of malignancy.

A polypus in the post-nasal space must be distinguished from enlargement of the posterior ends of the inferior turbinates, from adenoids, and from various forms of new growth springing from the vault or protruding from the posterior choanæ. Examination of the post-nasal space with the rhinoscopic mirror will settle any doubt in the diagnosis.

The prognosis of nasal polypi is not satisfactory, if left untreated they show no tendency to disappear, but rather increase in size and lead to complications such as various lung conditions, chronic bronchitis, asthma,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

middle-ear disease, impairment of the general health, and inflammation of the underlying bone extending into the sinuses. Even after removal of the polypi the source of the disease is not removed, the rarefying osteitis of the underlying bone continues, and fresh inflammatory œdema of the mucous membrane results, leading to recurrences. It is therefore essential, besides removing the polypus as close to its base as possible, that the affected bone should be curetted.

The prognosis is best in the case of solitary polypi, without sinus suppuration and of slow growth, and worst in the case of quickly growing polypi in the presence of sinus suppuration. In the former—due in the majority of cases to non-purulent nasal catarrh—simple removal by the snare without curetting will be sufficient to effect a cure; in any case it is inadvisable to curette until all the polypi have been removed by snare or forceps. By means of the curette the diseased and broken-up ethmoidal cells are scraped away. The bleeding is usually very profuse and preparation must be made for it. If possible, the patient should be prepared before the operation by the administration of some substance that will increase the coagulability of the blood. Packing the nasal cavity after operation is not desirable as it increases the liability to sepsis. Adrenalin solution should be used very sparingly as severe reactionary hæmorrhage is likely to set in afterwards. The after-treatment is important, especially in the cases with muco-purulent discharge, the nose being syringed daily with normal saline. If the discharge continues, painting the affected area with a 10 per cent. solution of nitrate of mercury ointment in liquid paraffin will prove satisfactory and will prevent the spread of the sepsis backwards to the pharynx and tonsil. Small granulations occasionally appear on the surface of the ethmoid bone several days after the operation; these are best treated by the application of chemical caustics such as a bead of silver nitrate or chromic acid fused on the end of a probe; these caustics should not, however, be applied to tags of mucous membrane or polypoidal remains owing to the inflammatory reaction that is likely to ensue.

The Bromsulphalein Test of Liver Function.

By ERNEST BULMER, M.D., M.R.C.P. (Edin.), M.R.C.P. (Lond.).

(*The Lancet*, August, 1928, p. 235.)

BROMSULPHALEIN or phenoltetrabromphthalein sodium sulphonate was prepared by White; it is a whitish powder very freely soluble in water, and it can be given with impunity by intravenous injection in a concentrated solution. It is non-irritant, and in ordinary doses absolutely non-toxic. Normally the dye is seized by the liver, and the majority is excreted in the bile, traces only appearing in the urine. The rate of disappearance of the dye from the blood serum is important—after five minutes 20—50 per cent. remains in the blood, whilst at the end of half an hour there is none at all or a mere trace. It was argued that if the liver were damaged it would remove the dye with less rapidity from the blood after injection, and that the degree of retention of dye in the blood stream would give an indication of the degree of liver damage; the originators of the test, Rosenthal and White, denied that it had any dependence upon biliary permeability.

Technique.—The patient is weighed and the dosage is calculated on a basis of 2 mg. of the dye per kilo body-weight—the body-weight of the patient in pounds divided by 55 will give the exact quantity in cubic centimetres of the 5 per cent. solution employed. It is injected slowly into one of the arm veins. Thirty minutes after the injection, a sample of blood is withdrawn, preferably from the opposite arm, and in cases of early liver disease it may be necessary to take a sample after five minutes. After the blood has coagulated it is centrifugalised and the clear serum is pipetted into two small test-tubes. To one of these is added one or two drops of a 10 per cent. solution of sodium hydroxide to bring out the colour of the dye, and to the other tube a drop of 5 per cent. hydrochloric acid to clear the serum of any hæmolysis. The amount of dye in the serum is now estimated by direct comparison with a series of standards, using a simple comparator box in the usual way. The standards may be prepared by adding 4 mg. of the dye to 100 c.cm. of water that has been alkalinised with 0.25 c.cm. of a 10 per cent. solution of sodium hydroxide. This represents the 100 per cent. standard, and a series is prepared ranging from 5 per cent. upwards by dilution with alkaline water. In practice it is much simpler to employ the series of non-fading standards prepared by Hynson, Westcott, and Dunning. The 100 per cent. standard represents the amount of the dye that would be present in the blood stream if none were removed; it is thus an arbitrary standard calculated on blood volume.

Clinical Findings.—(Rosenthal and White).

	Cases.	Retention expressed in percentages after 30 minutes.
Non-liver	25	0 or a mere trace.
Obstructive jaundice ..	5	97, 96, 90, 35, 30.
Cancer of liver ..	2	99, 20.
Catarrhal jaundice ..	3	75, 50, 35.
Arsphenamine jaundice	2	47, 22 (after 15 min.)
Biliary cirrhosis ..	1	45.
Portal cirrhosis ..	3	?, 22, 17.
Syphilitic cirrhosis ..	1	3.
Pre-eclamptic toxæmia	1	30.
Acute cholecystitis ..	1	10.
Chronic cholecystitis ..	1	5.

From experience with his own cases the writer arrived at the following conclusions:—

(1) Normal cases and those without any liver lesion showed a retention of 5 per cent. to a mere trace or even no dye at all.

(2) Cases of liver disease showed a retention which probably represented fairly accurately the degree of liver damage or functional impairment; 100 per cent. retention means that no dye is removed from the blood, and a retention of, say, 50 per cent. would mean that the liver was 50 per cent. incompetent, and so on.

(3) The test is one of liver function and not of biliary permeability; this is proved by the fact that many of the cases of complete obstructive jaundice did not give a 100 per cent. retention.

(4) The test is safe, simple, and it appears to be the best one we have.

A Note on Blood Changes Associated with Liver Diet in Young Convalescents.

By K. SHIRLEY SMITH, M.B., M.R.C.P. (Lond.)

and

L. E. H. WHITBY, M.D. (Camb.), M.R.C.P. (Lond.)

(*The Lancet*, August 11th, 1928, p. 277.)

IN order to find out whether the blood changes obtained with liver diet in cases of pernicious anæmia were confined only to that disease, it has been thought worth while to study the blood changes produced by the same diet in hospital patients free from any blood disease. Whereas the original work of Whipple indicated that liver diet was likely to be useful in all forms of anæmia, the first recorded results with liver diet in pernicious anæmia suggested that it was most specific for pernicious anæmia and exerted its maximum effect only in that disease. Recently it has been found by Vaughan and others that some cases of secondary anæmia respond to liver treatment, and we have found that relatively normal children show a transient but definite stimulatory response to liver feeding.

The 11 cases selected for treatment in this investigation were between the ages of 3 and 15 years with the single exception of one girl aged 19. The majority of the patients were in surgical wards and were, during the experimental period, convalescing from such surgical conditions as inguinal hernia, tuberculous adenitis, and submaxillary abscess; others were in medical wards under treatment for such diseases as mediastinal adenitis

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and oxaluria. On account of the special interest attaching to the blood changes observed in them, two cases are included in which the lymphatic system seemed principally affected; these were cases diagnosed as Hodgkin's disease and glandular fever.

Fresh cooked liver was given daily, the amount varying with the age of the patient; the older patients received 3 oz. daily and the younger ones 2 oz. A blood examination was made in every case before starting the diet and the feeding was continued for periods, varying between six and forty days. In the first few cases examinations were made at intervals of three or four days for a period of three weeks, but experience showed that the maximum effect was noticeable after about six days and that it declined thereafter. In no case were hæmatinic drugs given during the time of liver feeding.

Such observations as were made on the red cells and hæmoglobin show that these tended to increase. A leucocytosis was produced in seven out of the 11 cases. In seven cases also there was an increase in the relative and absolute number of polymorphonuclears. Neither the increase in the total leucocytes nor the increase in polymorphonuclears was maintained for longer than ten days. Lymphocytes showed a relative but not absolute reduction in nearly all cases. A definite absolute increase in eosinophils was produced in all instances, the striking figure of 61 per cent. being found in the case of Hodgkin's disease. An increase in granular or bone-marrow cells was also the rule. These results show that the administration of liver to patients who suffer neither from pernicious anæmia nor any other blood disease produces alterations in the blood comparable to those occurring in the treatment of pernicious anæmia. An interesting feature of the series is the eosinphilia which has been also found in pernicious anæmia by one of us and in secondary anæmia. The definite increase in the red cells and bone-marrow leucocytes shows that liver must exert a stimulating action on the bone-marrow. It is difficult to believe that stimulation is the only action in pernicious anæmia though evidently it is one essential feature.

We are inclined to suggest that liver is rich in a substance essential for the proper functioning of the bone-marrow; in pernicious anæmia, this substance, whatever it may be, is not absorbed in sufficient quantity from an ordinary mixed diet, perhaps on account of the achlorhydria, though it is possible to assimilate enough with massive liver feeding.

(These observations add support to the suggestions in the editorial note in the September number of this journal, namely, that this treatment should be given an extended trial in this country.—EDITOR, *I. M. G.*).

The Problem of Mount Everest.

(From the *British Med. Journ.*, August, 1928, p. 347.)

THE news that an eminent British physiologist has, this summer, blazed a new and unsuspected trail to the summit of Mont Blanc reminds us that mountaineering is, historically, a pursuit of scientific men. In the eighteenth and nineteenth centuries mountain climbing was undertaken almost exclusively by men whose interest was to observe the effects upon themselves of exposure to low barometric pressures. Within more recent years climbing has become a sport attracting men of divers callings, but such names as Hingston, Wollaston, Longstaff, and Somervell remind us that there are still to be found medical men fit and ready to share in the most hazardous expeditions to high altitudes.

These names, and with them the epic stories of those supreme adventures in mountaineering the several Everest expeditions, are brought to mind by a recent contribution to the *Lancet** on the physiological "Problem of Mount Everest," by Dr. Argyll Campbell. By general consent, the physiological limitation to the attainment of great height resides in the limit of man's adaptability to environments of abnormally low partial pressures of oxygen. At the top of Mount Everest the tension of oxygen is only about 7.5 per cent. of an atmosphere, being but a third of that at sea-level. What are the physiological effects of low tensions of oxygen? To answer this question the physiologist has taken his laboratory to the mountain. He has also sought to bring the mountain into his laboratory. Closed chambers have been devised in which the subject of experiment is placed and in which the composition of the atmosphere may be controlled at will. Here may be studied the physiological and psychological effects of exposure to any desired oxygen tension under all manner of conditions of rest and activity. Many such studies have been made on man, and this "armchair mountaineering" has not been without its thrills. But the simulation of such extremes of atmosphere as those obtaining at the summit of Everest are not feasible with man, and Dr. Campbell's observations on animals are of special interest on this account. He has made prolonged studies of the effects upon a variety of animals—mice, rats, rabbits, guinea-pigs, cats, and a monkey—of lengthy sojourn in the decompression chamber. The animals were subjected to a gradual reduction of oxygen tension spreading over several weeks until a partial pressure of 7.5 per cent. of an atmosphere was attained. The rabbits, rats, and mice alone survived, and even amongst these groups there were casualties. The most notable pathological change observed was an extreme congestion of the liver and parts of the heart and lungs. This congestion must be attributed to failure in the forward movement of the blood for which the heart is held primarily responsible, though failure of the vasomotor nervous centres or other factors controlling capillary dilatation may be contributory. Dr. Campbell concludes that the ability to withstand low tensions of oxygen is conditioned by the ability of the heart muscle to maintain an efficient circulation under the abnormal conditions.

What, then, is the contribution of these experiments to the "problem of Mount Everest"? In the first place it is argued that the permanent effects of high altitudes are gradually established as the result of prolonged exposure to lack of oxygen. It, therefore, seems plausible that the daily inhalation of oxygen for several hours when at the base camps would be preferable to the policy of reserving the oxygen supply for use during the actual climbing at greater heights. It is further suggested that daily subjection to low tensions of oxygen in the decompression chamber might prove to be of valuable assistance in the selection and training of suitable climbers.

The experimental animals of Dr. Campbell were not required to undertake arduous exercise, and were not subjected to low temperatures, snow, ice, and chilling winds. Is it to be wondered at that his results give the author no confident grounds for the faith that man will conquer Everest and return? Yet such is the heart of man that we doubt if he will take "No" for an answer. Indeed, when we recall how near—how tragically near—to success were Irvine and Mallory and how Norton and Somervell reached 28,000 feet and came back, it is difficult to believe that the little more is beyond human reach.

*July 14th, 1928, p. 84.

Observations on Ultra-Violet Ray Therapy.†

By E. P. CUMBERBATCH, B.M. (Oxon.), D.M.R.E. (Camb.), M.R.C.P.

(*The British Med. Journ.*, July 14, 1928, p. 43.)

THE first fact to recall is that ultra-violet rays are not all of the same kind. They differ in their wave-length, and they do not all possess the same biological, chemical or physical properties. Those with the shortest wave-length I shall designate by the number 20, and those with the longest wave-length by 39.‡ There are

†Abstract of a British Medical Association Lecture delivered to the Southport Division, March 30th, 1928.

‡These numbers, when multiplied by ten, give the actual wave-length in millionths of a millimetre; when multiplied by one hundred they give the wave-lengths in what are known as Angström units. The shorter figures are less confusing for lecture purposes. The expressions "short," "medium," and "long," when applied to the rays, refer to their wave-length.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

rays of every wave-length between 20 and 39. Rays with wave-length shorter than 20 do not concern us, because they do not reach the body. Those with wave-length of 40 are the *visible* violet light rays. The *visible* red light rays have a wave-length of 79. Rays with wave-length of 80 and over are the radiant heat waves, sometimes called the infra-red rays. I mention these facts because the ultra-violet lamps also emit these other rays as well as the ultra-violet, and the former possess therapeutic properties too. So when the practitioner exposes his patients to the ultra-violet lamp he administers phototherapy and thermotherapy as well as ultra-violet therapy. This is especially the case when certain types of lamp are used.

When these different rays fall upon the body they penetrate for certain distances, and then they are absorbed. Rays possess energy, and this energy is not lost when the rays are stopped. Either heat is produced or chemical changes occur, depending on the wave-length of the rays and the kind of tissue in which the rays are absorbed. The tissues react to these thermal and chemical changes, and various biological effects ensue. These effects, whether physiological, pathological, or therapeutic, are the outcome of the thermal or chemical changes caused by the rays.

Before we study these effects I must say a few words on the distance to which the different rays penetrate before they are stopped. This is important, because various kinds of tissue lie in the path of the rays, and the distance reached by the latter is dependent on the nature of the tissue as well as on the wave-length of the rays. Ultra-violet rays with wave-length from 20 to 24 are stopped in the stratum corneum of the epidermis. Those with wave-length from 25 to 33 pass through this layer, but are stopped in the stratum mucosum of the epidermis—that is, in the living epidermal cells. Those with wave-length from 34 to 39 pass through the entire epidermis, but are stopped by the blood in the sub-epidermal capillaries. Rays with wave-length of 40 (these are the visible violet light rays) probably do not penetrate further than the longest ultra-violet rays. On the other hand, the visible red rays (wave-length 79) have a much greater penetrating power; some of them reach the superficial strata of the muscles under the deep fascia before they are stopped. The visible green and yellow rays have an intermediate penetrating power. The invisible heat rays have a feeble penetrating power. It is doubtful whether those with the shortest wave-length (80) penetrate much deeper than the sub-epidermal capillaries, while those with longer wave-lengths do not penetrate as far.

We may now study the action of the various rays on the tissues which absorb them. As I have already said, the rays expend their energy in the production of thermal or chemical changes; their action ends there. The infra-red rays heat the tissues that absorb them. Since their penetrating power is very slight the distribution of the heat is superficial. The maximum temperature is produced on the surface; below the surface the temperature rapidly drops to normal. The visible light rays also expend their energy in the production of heat. By reason of the greater penetrating power of most of these rays they can heat to a greater depth than the infra-red rays. By means of the visible red rays it is possible to elevate the temperature of the superficial layers of muscle under the deep fascia. The ultra-violet rays with the longest wave-lengths (34 to 39) expend their energy in heating the blood in the sub-epidermal capillaries. They have no action, so far as is known, on the epidermis. These are the so-called "long" ultra-violet rays.

The rays which pass through the stratum corneum but are stopped by the cells of the stratum mucosum (25 to 33) produce *chemical* changes in these cells. These changes are of a destructive nature, and they kill the cells if the rays are sufficiently intense or are applied for a sufficiently long time. The dead cells are cast off by the process of desquamation. The separation of the remains of dead cells is, of course, a natural process, but in physiological states the cells that are cast off have died of old age. The artificial destruction of epidermal cells by ultra-violet rays is followed by certain biological effects. They will be described presently. These rays are sometimes called the "medium length" rays. The rays with wave-length from 20 to 24 (the "short" rays) do not pass beyond the horny layer of the epidermis. Since this layer is composed of dead tissue the rays cannot produce any biological effect in it. If they fell on living tissue they would destroy it, but only to a very slight depth, because their penetrating power is so little. These very short rays can also kill bacteria; but to kill them they must reach the bacteria and not be stopped by overlying tissue. Unfortunately the rays which are most powerfully bactericidal (23 to 24) have a very feeble penetrating power. As the wave-length gets longer the germ-destroying power falls rapidly. Consequently we cannot expect ultra-violet rays to destroy bacteria (that is, by *direct* action) if they lie more than the very slightest depth below the surface.

There is another important chemical change which the rays bring about. This is what is known as the "activation of cholesterol." This substance is present in all growing tissues, and it plays an important part in metabolism. It cannot perform its function unless it is rendered active. Ultra-violet rays possess this activating power. In this way the curative action of the rays in rickets is explained.

Let us now consider the biological effects which follow the physical and chemical changes brought about by the different rays. The invisible heat rays and the visible light rays are thermogenetic. Consequently the biological effects of these rays are those of heat. The effects of heat are far-reaching, but the time at my disposal does not allow me to go into the matter. I might mention, however, that heat increases the action of those ultra-violet rays which bring about chemical effects.

It is believed that the ultra-violet rays with the longest wave-lengths (34 to 39) have no chemical action on the tissues. It is probable that they are thermogenetic. Their biological effects are therefore those of heat. The chemical changes induced in the living epidermal cells by the rays of shorter wave-length are not immediately followed by any visible effect; but after an interval of two to ten hours there develops an erythema. It lasts from a few hours to a few days, according to the length of exposure and the intensity of the rays. It then fades away. Desquamation begins after four or five days. The degree of erythema and the amount of the desquamation also depend on the length of exposure and the intensity of the rays—that is, on the dosage. With small doses the erythema is slight and the desquamation is indiscernible. With less small dosage the erythema is more evident and the desquamation is apparent. With heavy dosage the erythema is intense and blisters may form. After a few exposures sufficient to procure a fair degree of erythema there develops in many subjects a pigmentation of the skin. This is due to the formation of a substance known as "melanin" in the basal cells of the epidermis. The most potent erythema-producing rays are those with wave-lengths from 29 to 30. The pigment-producing rays are those with wave-lengths from 29 to 33. Rays with wave-length a little shorter than 29 can produce marked erythema without pigmentation.

Accompanying or following these changes in the skin are others in other parts of the body, but the mechanism of their production is not known. We may attribute them to the absorption of substances formed by the action of the rays on the epidermal cells. One of these substances is activated cholesterol. Some of these changes are known. One of these is an increase of the calcium and phosphorus content of the blood; more are absorbed from the alimentary canal. The calcium content of the blood cannot be increased by taking calcium compounds by the mouth. Hence this method of administration is of little value unless the skin is irradiated by ultra-violet light. The red blood corpuscles and hæmoglobin are increased by a course of exposure of the skin to the rays.

Another very important change is an increased power of the irradiated body to combat chronic infection. Eidenow has shown that the bactericidal power of the blood of animals is increased by irradiating the skin.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In man, however, the bactericidal power of the blood is usually high, but it is possible that the gain in power to deal with infection may be due to the absorption of proteins which may be formed by the destruction of the protoplasm of the epidermal cells, the action perhaps being akin to that of protein shock.

The ultra-violet rays, or the products of their action on the epidermal cells, stimulate the nerve endings. In this way the organs of the body and their blood supply may be influenced by reflex action. The dilatation of the subepithelial blood vessels is an axon reflex (Dixon). It is likely that there are other forms of reflex action. The internal secretion of the ductless glands may be influenced. The nature of the influence—whether stimulation or depression—and the wave-lengths which are most potent for the production of different effects are at present unknown, and need investigation by the experimental physiologist.

Our knowledge of the physiological properties of ultra-violet rays is insufficient to enable us to foretell with accuracy all the diseases which can be successfully treated. Most of what we know regarding the therapeutic properties of these rays has been learnt by clinical experience. The power of the rays to produce erythema renders them useful in the treatment of inflammation of the skin when the state is chronic and the blood supply poor. The *direct* bactericidal power of the rays renders them of some additional use in local infection, although this action is very restricted on account of the slight penetrating power of the germ-killing rays. The production of local erythema is of use in the treatment of referred pain. Relief may be procured by a process of the nature of counter-irritation. The increased power of the body to deal with infection after administration of the rays renders the treatment of value in cases where the resisting power of the body is enfeebled, as in conditions of debility after fevers or local infection. The increased absorption of calcium and phosphorus following general irradiation renders the treatment of value in certain types of bone disease, and, if suppuration is present, there is an additional indication by reason of the enhanced power of the body to combat infection.

Thus it is mainly by *indirect* action that the ultra-violet rays bring about therapeutic action. Obviously it must be by indirect action when the disease is deeply situated and beyond the range of penetration of the rays. But even when the irradiated skin is the seat of disease it is almost always by indirect action that therapeutic results are obtained. These results can be obtained by exposing the skin of other parts of the body and leaving out the affected part. It is only in a very few diseases that local treatment of the affected part gives some benefit, and even in these the treatment of other areas of the skin—that is, *general* treatment—is of more value than the local.

Apart from their power to activate cholesterol and increase the absorption of calcium and phosphorus, and perhaps their power to increase the resistance to infection, none of the known therapeutic properties of ultra-violet rays are peculiar to them and not possessed by some other agents. Many of the maladies for which the rays are recommended by various workers can be treated just as well, or better, by other physical or electrical or thermal agents. I say this with no intention of disparaging ultra-violet ray therapy. Indeed, this form of treatment is capable of yielding results such as a feeling of well-being, increased mental vigour, heightened resistance to infection, and other good effects in which the *modus operandi* of the rays is difficult to ascertain. Even for the production of results which can be obtained by other methods the rays are convenient and frequently efficient. But if we treat by ultra-violet rays all the cases that do not respond to drugs or expectant treatment we shall not obtain a good balance sheet of success and failure.

With regard to apparatus, there is no lamp which emits heat, light, and ultra-violet rays of every wave-length. Different lamps give different selections of all three. So far no essential difference has been established between the results obtained by the use of one type of lamp as compared with another. The plain carbon-arc lamp emits much heat and light, but the proportion of ultra-violet rays is small. Consequently the exposure of the patient is lengthy. By coring the carbon with certain metal salts the exposure can be reduced, but white fumes are given off, and these make the air cloudy and the objects in the room are gradually covered with a thin film of white powder. Lamps with tungsten electrodes are open to the same objection; their output is poor in heat rays but rich in ultra-violet rays. The lamp which I recommend is the mercury vapour lamp. Its output is rich in ultra-violet rays but poor in heat rays. It gives off no fumes. It is a clean, cold lamp. It works automatically, needing very little attention. Patients feel no warmth when under it, and they may complain of chillness during treatment, especially in the winter months, unless the room is adequately warmed. A lamp of full size should be chosen. Small lamps are not of much use. Treatment of relatively small areas of the skin can be given by their means, but too much time is occupied when general treatment is required. For local treatment of less accessible regions such as the nose, throat, etc., a special lamp, the water-cooled mercury vapour lamp, and quartz rod applicators, are used. It is also necessary when long exposures are to be given to cutaneous lesions and exsanguination of the skin is required. This type of lamp will only be needed by those who practise ultra-violet ray therapy as specialists.

I shall now describe what I think is the simplest and one of the most effective ways of administering ultra-violet ray treatment to the patient. It must first of all be realized that *general treatment*—that is, the exposure of the entire skin or large areas of it—is necessary in almost all the diseases which can be benefited by the rays. General treatment is required if the disease is general, even if its manifestations are local. It is necessary even if the disease is local. Only in a very few local diseases is local treatment advisable.

The patient, divested of clothing, except that covering the genitalia, should lie horizontally on a couch on his back, his eyes protected by goggles. The lamp should hang three feet above the middle of the body, but a little to one side, so that if the lamp should break the hot mercury will not fall on the skin. At his first visit give a two minutes' exposure to the anterior surface. Then turn him on his back and give the same length of treatment at the same distance. Repeat the treatment every other day, increasing the exposure by half a minute at each successive visit until he receives ten minutes to the front and ten minutes to the back. This will complete a course of treatment. This method will, in the great majority of patients, cause little or no erythema, scarcely any desquamation, and no pigmentation. If erythema is caused it is faint and transient, lasting for a few hours only, and disappearing before the next treatment. Should it be noticed when the patient comes for his next treatment, he should receive no further application until it has disappeared; his next dose should be no larger than the preceding one. Should it be found necessary to give a longer course, time can be saved by bringing the lamp nearer the patient—say two feet. If this is done the exposure should last, not ten, but five minutes.

Children should receive an exposure of one minute at their first visit, and it should be increased by half a minute at each successive visit. In the case of infants the initial exposure should be half a minute and subsequent exposures should be increased at the rate of a quarter of a minute for each successive treatment. These figures are only intended to provide a rough guide. If, on any occasion, the patient interrupts his course, the practitioner, when resuming the application, must take note of the length of the intermission and reduce the length of the next exposure in accordance. If the interval has been as long as two weeks or more he should resume with the initial dose.

Local treatment can be practised to a limited extent with the mercury vapour lamp. The action of the rays can be restricted to the affected area of skin by shielding the skin in the vicinity by black paper. When

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

giving local treatment it is usually necessary to increase the dosage so as to procure evident erythema. The skins of different patients vary greatly in their sensitivity to the rays, and the dose which would cause slight erythema in one might procure intense redness and subsequent blistering in another. The best way to avoid this is to make a series of test exposures on small areas of skin. Four small windows, each being one inch square, should be cut fairly close together in a sheet of black paper. The paper should then be wrapped around the forearm and the four areas of uncovered skin exposed to the rays, the lamp being at a distance of two feet. These areas should receive one, two, three, and four minutes' exposure respectively. At the same hour next day the areas should be examined. The length of exposure to the area in which there is distinct redness should be the length of treatment to the affected region.

The diseases which may be treated by ultra-violet rays I shall classify in three groups. The first includes those in which the treatment will always effect a cure. The second contains those in which the treatment will generally effect a cure, either alone, or in conjunction with other forms of treatment. The third includes a large number of diseases or cases, mostly common and obstinate, for which the treatment is now being tried. In these diseases the insufficiency of experience renders it difficult to say whether the rays are of real use. To these groups I shall add a fourth, which will include those in which the treatment is likely to produce harmful results.

Group 1.—The disease which must be given pride of place in ultra-violet ray therapy is rickets. For this the treatment may justly be regarded as a specific. I do not know any other disease for which it is a specific, although tetany and laryngismus stridulus—when occurring in rickety children—are said to respond equally well.

Group 2.—In this group I would place first the cases of infants who are unable to assimilate their food, and who consequently waste. If no organic disease is present the major number begin to thrive and put on weight. The treatment must be applied very cautiously and minute doses given. Children who have been the subjects of the fevers which commonly occur during their early years, and are left in a weak debilitated state, respond well to the treatment. Their health improves and they gain in weight. Nasal and bronchial catarrh lessens or disappears, and aural discharge loses its offensive character and may disappear. If the last-mentioned trouble is present, that most valuable form of treatment, zinc ionization, must not be forgotten. Adults who are left in a debilitated state after influenza or similar types of fever improve greatly after ultra-violet irradiation. In surgical tuberculosis the rays can play a valuable part in bringing the disease to an end; but additional treatment is generally required, such as surgery, application of splints, etc., and residence at the sea or in the country are necessary for most cases. For this reason the treatment of surgical tuberculosis by ultra-violet rays in large towns is frequently unsuccessful. In dermatology the disease which is most often treated by the rays is lupus vulgaris. General treatment is more effective than local, though they can be combined with advantage. Local treatment requires the water-cooled lamp. The electrothermic methods are very useful in local treatment, but general treatment should not be omitted. Other infective diseases of the skin, such as impetigo contagiosa and acne vulgaris, respond well. Patients who are liable to boils and carbuncles may be treated by the rays with advantage. Their low resistance to infection by staphylococci can thereby be increased. In seborrhœa I have had some good results in obstinate cases. In true eczema success is not often obtained. The so-called "weeping eczema" (which is really seborrhœa) improves under the treatment, and the "trade eczemas" (which are really forms of dermatitis caused by chemical irritants) can be cured if the causes are removed. Non-specific indolent ulcers should receive a trial of the treatment, both local and general, and success will often be obtained. Erythema pernio is said always to respond to the rays, but I prefer diathermy. In true psoriasis I have had no success with ultra-violet rays. Some cases of pruritus ani and vulvæ can be freed from the itching. These cases require local treatment, and when it is given every particle of mucus and exudation and previously applied unguents must be removed. Some writers have described good results in the treatment of erysipelas by the rays. I have had no personal experience. In alopecia areata the hair grows again after a course of local treatment by the rays. A long course may be required.

Group 3.—This includes a large number of chronic maladies and obstinate cases which resist drug treatment. The "rheumatic material," such as chronic fibrositis and arthritis, with which the various departments of physiotherapy are so plentifully supplied, has been treated by the rays, but I have had infinitely better results—at any rate in women—by pelvic diathermy. Treatment of chronic fibrositis and arthritis by the rays will generally be followed by disappointment. The ultra-violet rays have been tried in infection of the uterus and its adnexa and the pelvic supporting tissues, erosion, and some forms of dysmenorrhœa, but here again pelvic diathermy gives far better results. In obstinate cases of sciatica and brachial neuritis I have had little success with the rays after other forms of physiotherapy had failed, although it is possible that the cases which had been cured by the latter would have responded to the rays. Hyperpiesis, chronic bronchitis, bronchial asthma, hay fever, Raynaud's disease, acrocyanosis, and other diseases are being treated by ultra-violet rays, and success has been claimed by different writers, but sufficient experience has not been gained to enable a definite statement to be made regarding the therapeutic value of the rays in these diseases.

Group 4.—This includes the diseases and patients for which the rays should be administered with extra caution or not at all. Patients with general pyrexia should not receive ultra-violet ray treatment. In acute local infection the rays should not be applied locally, nor should general treatment be given if the body temperature is raised. If pus is present the treatment should not be given until it has been evacuated. If it is suspected, the treatment should be postponed. In pulmonary tuberculosis the treatment should not be given, except by an expert; quiescent phthisis has been rendered active. It is inadvisable to apply the rays to patients who are suffering from failing hearts or who are the subjects of Bright's disease. It is generally inadvisable to give the treatment to very old people. During menstruation ultra-violet ray treatment should be omitted.

In concluding a short lecture on a very large subject I would insist on treatment by ultra-violet light being under the direction of medical men. Unqualified people, even if they are trained, can only administer the rays, but the doctor can employ them to treat disease.

Migration of Hookworm Larvæ from Cultures.

By CLAYTON LANE, M.D. (Lond.),
LIEUTENANT-COLONEL, I.M.S. (Retd.)

(*Trans. Roy. Soc. Trop. Med. and Hyg.*, January, 1928, Vol. XXI, p. 309.)

AN important observation, is recorded viz., that in hookworm cultures made after the usual method, there is a considerable migration of larvæ out of the culture. As this fact has not been previously recognised all the existing information regarding length of life of larvæ in soil, the number of larvæ recoverable from a given culture, etc., are of little value as they have been made on untrapped cultures, and the more active these larvæ are the more they are liable to stray. A method of trapping the cultures by placing them in a larger Petri dish than that in which the culture itself is set up is described.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The Treatment of Early Rodent Ulcer.

By J. FERGUSON SMITH, M.A., M.B., Ch.B.

(*The Brit. Med. Journ.*, September 8th, 1928, p. 443.)

REASONABLY early basal-celled epitheliomata can be treated in a large number of ways with a high percentage of successes, but most methods are open to some objection. Adamson's plan of curetting, followed by a massive dose of *x*-rays, is one of the very best, but it demands apparatus and technique beyond the compass of the general practitioner. The same applies to radium, with the additional drawback that all cases do not respond to it. Diathermy is effective, but cannot safely be employed in the near neighbourhood of the eyeball. Surgical excision is good, provided that a wide margin is possible, though even then recurrence in the scar may be seen. In the neighbourhood of the eye excision may have to be on a mutilating scale, followed by plastic work, and as even then no certain promise of cure can be given, such procedures are, in my opinion, quite unjustifiable. I have in the past used many methods, but for over four years I have treated all my early cases, up to the size of, say, a shilling, by the following simple technique.

The rodent ulcer is ringed with novocain (2 per cent.), and then firmly scraped with a sharp spoon. Only the tumour comes away, and a clean raw area is left. A pencil of CO_2 snow in a vulcanite applicator is applied with firm pressure for sixty seconds, and then a dry dressing is put on. There is considerable œdema of the part for a day or two, but practically no pain at any time, and the ulcer heals rapidly under boric ointment.

The number of cases thus treated and observed for at least six months (the majority for much longer) is sixty-five. Of these, two showed small recurrences at the edge of the scar, where presumably an outlying nodule had escaped destruction. These recurrences were successfully treated by a repetition of the procedure. Recurrence in the depths has not so far occurred. The resulting scars are always very smooth and fine, and in the case of small rodents about the eyelids, or in the naso-labial furrow, almost invisible. The apparatus required is neither elaborate nor expensive, and the technique is exceedingly simple, and there is no reason why practically every basal-celled carcinoma should not be detected and cured by the patient's family doctor. The procedure can be carried out in the consulting room, even on old people, who suffer neither from shock nor pain, and are perfectly fit to go home immediately afterwards.

No claim for originality in this method is made, as no doubt it or something similar is used by many other workers, but I have been moved to write this account by a recent experience of recurrences following radium, *x*-rays, and excision, in other hands, and by published accounts of methods which I believe to be inferior to the one here given.

Culture and Differential Diagnosis of the Various Leishmanias (Kala-azar, Oriental Sore, Brazilian Leishmaniose) on solid culture-medium.

By MARTIN MEYER & JYOTIS CHANDRA RAY.

Translated from the "*Archiv. f. Schiffs. u. Trop.*" Bd. 32. 1928. Heft. 4.

NOLLER had described in 1917 a method for "Blood and Insect flagellates Culture on Plates" in this journal.* In this fundamental research he was able to show that it was possible to obtain by his method cultures of a series of different trypanosomes on plates, especially those from cattle, sheep, birds and frogs, as well as *Schizotrypanum cruzi*, *Leishmania donovani* and insect flagellates. Remarkable about this work was not so much the fact of his having obtained successful protozoon cultures, but that it was noticed that the flagellate colonies showed varying growth depending on their source of origin, so that a differentiation of the various species was possible.

After Noller's work, there appeared a few more works from him and his pupils who limited themselves chiefly only to trypanosomes.

We were able to begin a comparative study of the different leishmanias only after a sufficient batch of cultures was put at our disposal.

Technique.

The technique employed was scarcely anything different from Noller's. The culture-medium used was:—

Agar	30.0 gm.
Grape sugar lightly alkaline ..	20.0 gm.
Liebig broth	100.0 gm.

The higher proportion of agar proved to be better than Noller's formula for plate-agar. Sterile, defibrinated horse blood was added to an equal quantity of prepared agar, distributed in sterile test tubes and remelted. The mixture was poured out into Petri dishes 2.5 cm. deep specially made for this purpose. The plates were put inverted in a refrigerator and were inoculated with streak culture. The condensation water was removed from the lids with a 2 per cent. sublimate lotion and the lids were filled with a small quantity of sublimate lotion, according to Noller, to retain the humidity. The bowls were then kept at a constant temperature of 24°C.† in the inverted position, and the lid was cleansed and refilled every third day with sublimate lotion. It is impossible to avoid contamination through air bacteria in spite of utmost precautions taken. The only way to remedy it is to prick them out.

We used for our experiment the following batches of cultures:

I. *Leishmania donovani* (Kala-azar). 3 batches.

(*i*) Batch Mayer-Werner, 1914, from the peripheral blood of a kala-azar patient from India in the Tropical Institute at Hamburg.

(*ii*) Batch Sulimad, February 1924, from the peripheral blood of an Indian patient in the Tropical Institute at Hamburg.

(*iii*) Batch Assimoody, November, 1925, from the peripheral blood of an Indian patient in the Tropical Institute at Hamburg.

II. *Leishmania tropica* (Orient Sore).

(*i*) Batch Palastina: received December, 1926, through Professor Noller, Berlin, from Dr. Theodor, Jerusalem.

(*ii*) Batch Turkestan Jessner, received 1927, through Prof. Jessner. Königsberg who isolated it from a patient.

(*iii*) Batch Turkestan Moschkowski, received 1927 from Dr. Moschkowski—Moscow.

III. *Leishmania tropica*, var. Americana (Brazilian epidermal and mucous membrane Leishmaniasis).

(*i*) Batch Dr. Buss, received 1927 from Dr. Buss, Sao Paolo, Brazil.

All these batches were cultured further in the condensation water of NNN-agar medium at room temperature since the receipt, or isolation of original stock. The inoculation of the first plates was from these cultures, later several times direct from plates without any difference being noticed.

I. *Kala-azar* (Leishmania donovani).

Noller had already made attempts at a culture of the Mayer-Werner batch. By sufficient moisture, the colonies go out to the agar surface also in NNN medium test tubes and are to be seen as round, greyish-white colonies when isolated, or as greyish-white strings they flow together—it was not to be wondered that

* Noller, W., Blut—und Insektenflagellatenzuchtung auf Platten. *Archiv. f. Schiffs. u. Trop.*, 1917, Bd. 21, p. 53.

† Variations in temperature influence the growth in varying degrees.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

they grow prolifically on the Noller-plates. Noller described his results as follows:—

"It appeared after 16 days (the plates were kept at +22° to +25° in the dark) as a bluish grey white growth containing pure leishmania substance spreading out 4—5 mm. beyond the inoculated streak. The flagellates on the plates are always a bit smaller than in the condensation fluid, possess flagella and are actively motile. New plates inoculated with a needle full of this culture each time gave in 7 to 10 days' time, a compact grey streak, spreading 3 mm. beyond the line of inoculation and are limited, round, and smooth edged. There is usually no branching; now and then a few pseudopodic bulgings are noticeable. It is only on exceedingly moist plates, 35 days old, that we notice short parallel branches running out 1 to 3 mm. long, 0.3 to 0.5 mm. broad. If one inoculates a new plate with a bent needle a few needle-fulls of the culture and spreads evenly over the whole plate then in 2 to 3 weeks the whole surface is covered with thick greyish white fluff."

We would completely corroborate Noller's statements through our tests with all the three batches of kala-azar cultures; within a week in our case we got a thick, greyish white, spotted, shining layer with smooth edges. Characteristic is the limited lateral expansion in as far as the culture even after 3 weeks did not spread 3 mm. each side of the inoculating streak. We noticed after 3 to 4 weeks the bulging described by Noller as well as the small runners. We never saw large runners.

Under the microscope, we saw in Giemsa dry slide—that most of the flagellates were thick and short, among them a few slim ones just as we see in large quantities in relatively fresh NNN culture. The protoplasm takes on a rather light stain and behind the nucleus lie often a few dark diffused granules. The ill-defined nucleus lies often to one side, at other times in the middle and takes half of the area of the cell. The parabasal body is in most cases a rod transversly situated. The flagellum springs from the rejuvenated anterior part and is twice as long as the body.

II. *Leishmania tropica,* batch palastina.

In this variety, there develops first of all a thick layer along the original inoculations streak, then a somewhat thinner streak concentrically around this and often a third still thinner zone around the second. When expansion in this form, mostly in clear concentric layers, has reached 10 to 14 mm. each side of the inoculation streak, which generally is the case after 12 to 14 days, we noticed first an uniform indentation of the edges; these grow later to long, often bent, but *never branching* runners. The runners are strong and run out at right angles to the long inoculation streak and when a short streak is made as in the case of double bowl culture, they run radially from the centre to the edge of the bowl. The growth in the presence of sufficient moisture is almost unlimited till it reaches the edges of the bowl in a manner similar to many bird trypanosomes.

Fixed in warm sublimate alcohol and stained after Heidenhain "Klatschpreparate," the runners show closely arranged thick irregular parasites lying side by side like epithelium of cubic shape on the side of the runners, many in the process of division with their flagellum bent with their ends towards the periphery. At the apex, a few flagella are to be seen free in the lumen.

The flagellates gained from the runners after washing in saline solution are pointed oval and very motile; in a Giemsa dry slide they show a light blue stained protoplasma and broadly oval in shape. The nucleus is sharply defined and often fills up the whole cell body; the parabasal body is rod-shaped and sharp. The flagella are very fine and about 1½ to 2 times as long as the body.

Leishmania tropica Turkestan.

(1) Batch Jessner (Konigsberg). This grows precisely in a similar manner as the kala-azar type, in thick smooth shining layers which after a period of 8 days overspread 4 to 5 mm. on each side of the inoculation streak; but after about 10 days another thinner layer grows around the first layer, which shows at first a fine indentation of the edges and later net-like intertwining runners.

Under the microscope, we see a characteristic form in "Klatschpraparate." The edge of the runners as well as the network are composed of slim flagellates in a narrow layer, then follows a large number of round, dark-stained, forms without flagella in process of division, lying always in between interwoven rows of slim flagellates.

We see in Giemsa dry slides oval flagellates with pointed tail ends. The protoplasm is very dense, deeply stained and appears "frilled." In between we see many forms in the process of division arranged in rosette and flagellates in the process of disintegration. The nucleus is not sharply defined, the parabasal body is rod-shaped and lies across and flagella are relatively short.

II. *Batch Moschkowski.—Moscow.*

Grows similar to batch Jessner, but much thinner, almost like gossamer. After some time it also forms a net-like, intertwined runners, which are still finer and thinner and the single threads look like stringed pearls. It gives the impression as if it always first builds a small round colony, to which another new one attaches itself.

We see in "Klatschpraparate" that these fine strings are composed microscopically of a very thick matting of very slim flagellates, with very long and broad flagella.

In this plait-like matting lie the parasites bent slightly, but almost all of them lying in the same direction, very like a shoal of fish. We find a few isolated young unflagellated forms in process of division; just as Jessner's batch, scarce at the border, in larger numbers in the middle, but they are never so profuse as in Jessner's batch.

The Giemsa slides show a seemingly long and slim flagellum, which takes on a pale weak pink stain. The nucleus is very thick, and bulges out the protoplasm in its neighbourhood. The parabasal body is small and in most cases lying along one of the edges. The long flagellum, thrice as long as the body, is broad and ribbon-like. This powerful development of the flagellum explains also the peculiar growth.

Leishmania tropica, var. *Americana.*

The batch from the Brazilian mucous membrane leishmaniasis differs from the other three oriental boil batches in as far as it forms *no runners.* It shows a thin almost chiffon-like growth, the layer sometimes shows a little ruffling after a long time, the borders are always smooth and undented. The thin growth is not due in any way to an unsuitable culture medium, but to a strong rapid spreading superficial growth; within 10 days the culture spreads 1 cm. on each side of the inoculated streak.

The "Klatschpraparate" explains the form of growth without runners in the way that the flagellates show no tendency, right up to the furthest border, to wander outwards through spreading out their flagella. There are several thick rosettes of growth to be seen all over with the flagellate pointing inwards, specially at the edge where the layer is somewhat thinner. We can notice that it is always the thick flagellate bodies that are situated in an centripetal direction.

The Giemsa slides show the flagellates broadly oval with very dense dark brown stained protoplasm. The nucleus is mostly undefinable—the parabasal body is black, round and mostly along one of the borders. The flagellum is fine and mostly twice as long as the body.

Summary.

The cultures on horse blood-agar plates, after Noller, gave characteristic difference in growth among the organism of kala-azar and various batches from oriental boils and Brazilian leishmaniasis.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(1) *Leishmania donovani* forms, narrow thick layers without proper runners.

(2) *Leishmania tropica* from Palestine grows profusely with broad, parallel never-branching runners.

(3) Two batches of *Leishmania tropica* of Turkestan origin showed absolutely similar very strong runners, formation in the form of intertwined network, the first grew profusely and the other delicately:

(4) *Leishmania tropica* var. *Americana* from Brazil grow chiffon-like thin, without runners, but rapid superficial growth.

The microscopic examination showed the edges in all types to have characteristic groupings, divisions and forms of the parasites which well explain the various forms of growth. The dry slides also show the differences in the flagellate types regarding growth, form, staining and structure of the nucleus and flagellum.

The test gave the utility of this culture method for differentiating between the closely related blood flagellates and should be repeated on a larger scale with the other leishmania batches.

Studies on Malaria, with Special Reference to Treatment.

Part IX. Plasmoquine in the Treatment of Malaria.

By J. A. SINTON, Major, I.M.S.,
AND
W. BIRD, R.A.M.C.,

(*Ind. Journ. Med. Res.*, July, 1928, Vol. XVI, p. 159.)

Treatment of Benign Tertian Malaria.

ALL the patients were suffering from chronic benign tertian malaria and the disease was diagnosed by the finding of *P. vivax* in the peripheral blood immediately before the commencement of treatment. As in our other work a preliminary purgation with calomel and magnesium sulphate was given before the commencement of any course of treatment.

Plasmoquine.

The original communication received from the makers recommended the following course of treatment:—"The daily dose of 0.02 grm. plasmoquine, 3-4-5 times, should not be given more than 5 days in succession. The after-treatment is carried out in the same manner as that of quinine, viz.,

For 5 days plasmoquine.
4 „ rest.
3 „ plasmoquine.
4 „ rest.
3 „ plasmoquine.
4 „ rest.
2 „ plasmoquine.
5 „ rest.
2 „ plasmoquine.
5 „ rest.
2 „ plasmoquine.
5 „ rest.

"*Precautionary measures:*—When convulsive pains of the stomach or cyanosis of the lips are noticed after the administration of plasmoquine, it should immediately be stopped and only given again when symptoms have completely disappeared."

The recommended treatment, therefore, consisted of 17 days of treatment and 22 days rest, a total of 39 days, provided more rests were not required on account of toxic manifestations.

Series PM. 1.—The dosage recommended for strong adults was 0.06 to 0.10 grm. daily. In our cases the doses were graded as follows:—Patients weighing 7 stone received 0.05 grm. daily; those of 8 stone 0.06 grm; those of 9 stone 0.07 grm; those of 10 stone 0.08 grm; those of 11 stone 0.09 grm. and those of 12 stone or over 0.10 grm. The majority of our patients weighed about 10 stone each, so the usual daily dose was about 0.08 grm. on the days when treatment was given or an average total dosage of 1.26 grms. per patient. The spacing of the doses was as recommended above.

Twenty-nine patients were placed on this treatment and in two of them it was discontinued on account of persistent toxic symptoms.

Series PM. 2.—It was suggested in one of the circulars issued by the makers that better results might be obtained if the drug was administered continuously, as far as toxic symptoms would permit. It was, therefore, decided to try a series of patients on a "continuous" treatment, to last until the drug had been given on 28 days with as few rests as possible.

Twenty-two patients were started on this treatment, in which the daily dosage was 0.08 grm. plasmoquine irrespective of the weight of the patient. The total amount of plasmoquine received by each patient was 2.24 grms. and the time needed to complete the 28-day course varied from 28 to 53 days, with an average of 36 days. In two cases treatment had to be discontinued.

Plasmoquine Compound.

Eichholtz (1927), as a result of animal experiments, considered that quinine tended to lessen the toxic effects of plasmoquine. Manson-Bahr (1927*b*) and Schulemann and Memmi (1927), from their study of the use of the drug on malaria patients, considered that the addition of quinine to plasmoquine was useful in preventing the cyanosis sometimes seen during treatment. For these reasons larger daily doses of plasmoquine were used in these series of experiments.

Series PMC. 1.—The patients in this series were treated with daily amounts of plasmoquine compound equivalent to 0.10 grm. plasmoquine and 1.25 grm. quinine. The spacing of the doses was as in the PM. 1 Series, so that the total amounts of plasmoquine given during the 17 treatment days was 1.70 grm. per patient and of quinine 21.25 grms.

Fifteen patients were placed on this treatment and of these one was unable to complete the course on account of toxic symptoms.

Series PMC. 2.—The twenty patients in this series were given a "continuous" course similar to that of the PM. 2 Series. The daily dosage of plasmoquine was 0.10 grm. and of quinine 1.25 grm. making a total of 2.8 grms. plasmoquine and 35 grms. quinine during the 28 days of treatment. The time needed to complete the course varied from 28 to 52 days with an average of 37.5 days per patient. All the patients completed treatment.

Results of Treatment in the Prevention of Relapse.

Relapses were diagnosed as heretofore by the finding of parasites in the peripheral blood by the thick-film method of examination. These examinations were carried out weekly for at least eight weeks after the completion of all treatment (Sinton, 1926*a*).

Plasmoquine Treatment.—Eight patients out of the twenty-nine in the PM. 1 Series relapsed after treatment and two failed to complete the treatment on account of toxic symptoms. One case was lost sight of before the end of the period of observation after treatment. The observed relapse rate was 35.5 per cent. with a possible maximum of 38 per cent. and an observed minimum of 34.8 per cent. (*vide* Sinton, 1926*b*, p. 583).

Three patients out of the twenty-two in the PM. 2 Series relapsed and two others were unable to complete treatment because of toxæmia. The failure rate in this series was, therefore, 22.7 per cent.

Plasmoquine Compound Treatment.—Out of the fifteen patients in the PMC. 1 Series two relapsed and one could not complete treatment. The relapse rate was 20 per cent.

Eighteen of the twenty patients in the PMC. 2 Series completed treatment without relapse, while the remaining two were lost sight of at the end of the 5th and 6th weeks of observation after treatment. The after-histories of these two patients were traced and it was found that they had shown no clinical signs of malaria up to the end of two months after we lost sight of them.

One patient who was admitted for malignant tertian malaria received 0.16 grm. plasmoquine daily for 7 days,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

but relapsed with the same infection. He was then re-treated with 0.10 grm. plasmoquine and 1.25 grm. quinine daily for 7 days, but on this occasion relapsed with benign tertian malaria in spite of the two courses of plasmoquine.

Quinine Treatment (Control).—The observed relapse rate of 111 patients treated with quinine was 77 per cent. During the last five years over 1,000 patients suffering from benign tertian malaria have been treated in this enquiry by means of the various cinchona alkaloids with a relapse rate of about 70 per cent.

Discussion of the Results of Treatment.

Among the fifty-one patients treated with plasmoquine alone, the relapse rate averaged about 30 per cent. It was found that as the duration of treatment was increased from 17 to 28 days, the relapse rate fell from 36 per cent. to 23 per cent. Muhlens (1926) reports a relapse rate of 31 per cent. after plasmoquine as compared with 59 per cent. after quinine.

Amongst the thirty-five patients treated with plasmoquine compound, the relapse rate was only 8.5 per cent. The rate amongst the patients who received the shorter course was 20 per cent. as compared with no recorded relapses among those who received the longer course.

The relapse rate amongst the eighty-six patients treated with plasmoquine alone or in combination with quinine was only about 21 per cent. which is a remarkably low rate when compared with that amongst the controls and with those of other workers on treatments with quinine (Stephens, etc., 1917-1919; Acton, etc. 1921).

The combination of quinine with plasmoquine seems to be a distinct advantage and the results of the last treatment with plasmoquine compound are so remarkable that they will require confirmation on a larger series of patients.

There seems, however, to be no doubt that in plasmoquine a distinct advance has been made in the treatment of chronic benign tertian malaria, but, as will be seen from the section on toxic symptoms, the margin of safety in the dosage of the drug seems to be small.

The Effect of Treatment on the Prevention of Relapse in Malignant Tertian Malaria.

Most observers have found that while plasmoquine produces very beneficial effects in benign tertian malaria, its action is much less marked in the malignant tertian type of fever.

Discussion of Results.—A total of 14 cases suffering from malignant tertian malaria have been treated with plasmoquine alone or in combination with quinine and of these 10 or 71 per cent. have had relapses due to *P. falciparum.* Amongst 7 control cases treated with quinine and alkali the rate was only 14 per cent. Sliwensky (1927) reports 50 per cent. of relapses after plasmoquine treatment (22 patients) and 30.4 per cent. after the compound (125 patients).

Action on Sexual Parasites (Crescents).—Plasmoquine: Four crescent carriers were treated with doses of 0.08 grm. plasmoquine daily. In one patient the gametocytes were absent at the end of 24 hours, while in the other three they persisted for 1.3 and 5 days respectively after the commencement of treatment.

Plasmoquine Compound.—Two patients were given 0.01 grm. plasmoquine and 1.25 grm. quinine daily and in one case crescents were absent at the end of 24 hours, while in the other they persisted for 48 hours. A third patient given 0.08 grm. plasmoquine and 1.0 grm. quinine daily showed these forms for 48 hours but not later.

Toxic Manifestations.

It is evident from the literature that the administration of plasmoquine is liable to be followed by toxic symptoms of a greater or lesser severity even with doses of 0.10 grm. or less daily. In our patients the occurrence of distinct cyanosis or of abdominal pains was considered to be an indication for a rest in the course of treatment and the number of rests affords an indication of the extent of the toxic symptoms encountered by us. Some cases did not complete treatment, either because of the severity of the toxic symptoms, or because so many rests were found necessary that parasites were not eliminated from the peripheral blood.

Of the twenty-nine patients in the PM. 1 Series, twenty-two needed extra rests in addition to those on the schedule of treatment.

Four of these did not complete treatment. Excluding these four patients the total number of extra days of rest needed was 33 or an average of 1.3 days per patient. The maximum duration of treatment in any one case was 32 days. Of the 33 days rest required, sixteen or about 50 per cent. were required by twelve patients during the first week. Parasites reappeared in the peripheral blood of eleven patients during treatment.

Seven of the fifteen patients in the PMC. 1 Series required extra rests and one did not complete treatment. Among the remaining fourteen patients, the average number of days of rest needed was 1.0 day per patient. Eighty-five per cent. of these rests were needed in the first week. The maximum duration of treatment in any one case was 32 days. In only one case did parasites reappear during treatment.

In the "continuous treatments" twenty-one of the twenty-two patients in the PM. 2 Series needed rests during treatment, and two could not complete the course. The number of days rest required by each patient varied from 0 to 25 with an average of 7.5 days per case. This means that an average of 35.5 days was needed to complete the 28 days' continuous course. Rests were not specially required during the first week as compared with the later weeks and in no case did parasites reappear during treatment.

In the PMC. 2 Series, eighteen of the twenty patients needed rests but all completed the treatment. The number of extra days required varied from 0 to 24 with an average of 9.5 days per patient. As in the previous series, the days of rest were not more numerous during the first week as compared with the later ones, and no case showed parasites during treatment.

Toxic symptoms appeared most frequently about the fifth day of treatment and were usually only cyanosis and abdominal pains of varying intensity. These manifestations might appear separately or in combination. Abdominal pains were usually the first symptom to appear and then cyanosis, but cyanosis was often intense without any abdominal pains. A few patients showed intense pallor of the mucous membranes, especially those of the lips but this was not always accompanied or followed by cyanosis or abdominal pains.

The cyanosis, although taken to be a danger signal, did not seem to cause much discomfort to the patient. One case who had to take 25 days rest in order to complete his "continuous treatment," had intense cyanosis but no other symptoms. This patient was anxious to continue his treatment and complained on every occasion when it was stopped. Another became deeply cyanosed after 2 days of treatment and the condition did not disappear until he had rested for over a fortnight. As a general rule, however, toxic symptoms quickly disappeared when treatment was stopped.

No serious cardiac symptoms were seen but as noted by Barmann and Smits (1927), it was observed that the pulse rate after the first few days of treatment became slower than normal, usually about 65 per minute.

On those days when rests were needed on account of toxic symptoms the urine of all patients was examined as a routine measure. Albumen was detected in only one case, which was undergoing the "continuous" PMC. treatment. The albuminuria disappeared when a rest was given, but reappeared after treatment was recommenced.

Two patients in our series developed symptoms which gave rise to considerable anxiety. The first case was receiving a daily dose of 0.10 grm. plasmoquine and 1.25 grm. quinine, when on the morning of the third day of treatment he developed an ashy-grey pallor with slight cyanosis, vomiting and severe abdominal pains.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

He had 12 motions during the day and his temperature rose to 103°F. On the next day his temperature was 102.2°F. in the morning and fell to normal in the evening. The severity of the abdominal pains was less, but he passed over 20 motions during the day and was collapsed. On the following day he had improved and quickly recovered.

The second case, who was on the "continuous" PM. treatment and receiving 0.08 grm. daily, developed even more alarming symptoms. On the 25th day of treatment he was brought to hospital with vomiting, collapse, severe diarrhœa and subnormal temperature, in fact symptoms closely resembling an attack of cholera.

This patient had been quite well when given his last dose earlier in the day and apparently his attack had come on without any warning. He had previously stood the treatment very well and had only required two single days of rest. His condition caused considerable anxiety for some days, but he eventually recovered and did not subsequently relapse with malaria.

The very marked action of sugar and alkali in protecting patients against the toxic effects of stovarsol (Sinton, 1927), suggested that these substances might also protect against the deleterious effects of plasmoquine. To test this possibility, alternate patients were treated with and without these substances, but the results of the two series of 36 patients each showed no very decided differences.

Summary.

The results of our investigations may be summarised as follows:—

(1) After the treatment of 51 patients suffering from chronic benign tertian malaria with plasmoquine only, 30 per cent. relapsed, while amongst 35 patients treated with plasmoquine compound the rate was 8.5 per cent., as compared with about 70 per cent. amongst control cases treated with quinine.

(2) "Continuous treatment" seems to have a greater effect in producing a permanent cure in benign tertian malaria than has the "interrupted treatment," although more liable to be followed by toxic symptoms.

(3) A 71 per cent. relapse rate was observed in 14 cases of malignant tertian malaria treated with either plasmoquine alone or in combination with quinine while amongst 7 control cases treated with quinine and alkali the rate was only 14 per cent.

(4) Plasmoquine rapidly removes all forms of *P. vivax* from the peripheral blood and also the sexual forms of *P. falciparum*, but seems to have little action on the asexual forms of the latter parasite.

(5) Plasmoquine did not have as rapid an effect in the reduction of temperature as did quinine, but when given in combination with the latter drug its febrifuge action is enhanced.

(6) Severe toxic symptoms may follow the use of plasmoquine and the margin of safety with the present dosage seems to be comparatively small.

Conclusions.

(1) The discovery of plasmoquine has marked a distinct advance in the treatment of malaria, but, as pointed out by Manson-Bahr (1927), this drug should be "regarded as the beginning not the climax, of a new series of antimalarial drugs."

(2) In our experiments plasmoquine was much more effective in producing a permanent cure in benign tertian malaria and in abolishing crescents from the peripheral blood than quinine, but in the treatment of attacks of malignant tertian malaria the latter drug is still the treatment of choice.

(3) The low margin of safety in the dosage of plasmoquine renders it necessary that further experiments should be carried out to determine the best dosage and duration of treatment, before the drug is issued for general use outside hospitals.

Our thanks are due to the Director of Medical Services in India for the facilities which he has placed at our disposal for carrying out this work and to the Indian Research Fund Association who provided the money to cover the expenses of this investigation.

Gymnema sylvestre in Diabetes Mellitus.

By R. N. CHOPRA, M.A., M.D. (Cantab.),
LIEUTENANT-COLONEL, I.M.S.,
J. P. BOSE, M.B. (Cal.), F.C.S. (Lond.),
AND
N. R. CHATTERJEE, M.SC. (Cal.)

(*Ind. Journ. Med. Res.*, July, 1928, Vol. XVI, p. 115.)

Gymnema sylvestre is a stout, large, woody, climbing plant which grows abundantly in Central and Southern India and is also found in Tropical Africa. It is known in Sanskrit as "Meshasringi" meaning ram's horn, in Hindi it is called "Merasingi," in Bengali "Chota-dudhilata," and in Bombay "Kavali" or "Vakandi." Edgeworth noticed that when leaves of this plant were chewed the power of the tongue to appreciate the taste of sugar and all saccharine substances was abolished. This was confirmed later by Hooper who discovered that the leaf also had the valuable property of completely removing the taste of bitter articles such as quinine. The loss of these sensations does not last for 24 hours as was stated by Edgeworth, but only from one to two hours. The root of the plant has a reputation among Hindu physicians as a remedy for snake-bite. The powdered root is generally applied locally to the part bitten and decoction is administered internally.

On account of its property of abolishing the taste of sugar it has been given the name of "Gur-Mar" meaning "sugar destroying" and the idea has gained ground in some quarters that it might neutralise the excess of sugar present in the body in diabetes mellitus. In Bombay and Central India it has been used as a remedy against this condition and wonderful results have been claimed. The present investigation was undertaken to see if the drug really had any effect on the blood sugar in man and animals.

Conclusions.

From the results of our observations we feel justified in drawing the following conclusions:—

(1) The leaves of *Gymnema sylvestre* contain a substance which has a hydrolytic action on cane-sugar. There is also an oxidase-like substance which produces glycolysis in a solution containing glucose.

(2) The extracts made from the leaves of *Gymnema sylvestre* as well as gymnemic acid and its sodium salt have no effect on the blood sugar when given by subcutaneous injections to rabbits.

(3) Powdered leaves and alcoholic extracts prepared from the leaves of *Gymnema sylvestre* have no effect on the blood or urine sugar of patients suffering from diabetes.

The Report on Sanocrysin (Möllgaard) Investigation.

(*By The Sanocrysin Research Committee of Japan*, 1927.)

THE report on Sanocrysin investigation by the Sanocrysin Research Committee of Japan, constitutes an important contribution to the literature on this subject. An incidental item of interest reported by the investigators is the fact that sanocrysin or at least a closely allied compound, was first obtained by Fodros and Gelis in 1845 and was used by them in the treatment of syphilis. Its use in tuberculosis is due to the efforts of Möllgaard and his co-workers, whose experiences with this gold salt were embodied in Möllgaard's "Chemotherapy of Tuberculosis" first published in 1924. Since that date an extensive literature has grown up around this subject. From their *in vitro* experiments two of the investigators, Watanabe and Sato, conclude that sanocrysin can inhibit the growth of tubercle bacilli in a dilution of 1 : 10,000, but they find that the preparation in over 0.1 to 1 per cent.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

concentration does not injure the pathogenicity of tubercle bacilli—thus differing from Möllgaard with regard to the germicidal action of sanocrysin *in vitro*. The Japanese investigators also record wide divergences from the Danish pharmacologist on the subject of his specific immune serum. The results obtained with sanocrysin in human tuberculosis may be summarised in the workers' own words.

"(1) Sanocrysin used by us was prepared by Dr. Iwatare of the Ban-yu Pharmaceutical Company. From the chemical point of view this preparation is said to be identical with the European product.

"(2) The entire medical staff of the Clinical Department was enlisted, and to each member a number of patients were assigned. In this way a detailed record was kept of each patient. In addition, efforts were also made to obtain as much data as possible on urine, sputum, and Röntgenographic findings. Patients were regarded as 'improved' only when they showed improvement in all these respects. Those with unfavourable Röntgenographic findings were not placed under the head of 'improved,' even though all other conditions were more or less improved.

"(3) In view of the lessons learned from our animal experiments, we avoided using large doses of sanocrysin in a short period of time, as done by Möllgaard. Instead, we injected very small quantities with intervals of over one week between injections. The use of small doses on our part might account for the slight differences between our clinical results and the observations in animal experiments. We never felt the necessity of using the tuberculin immune serum.

"(4) We found that improvement was most frequently observed among light cases, especially of the stationary proliferative type. The outcome was very unfavourable in the progressive exudative type. This point differs strikingly from the result reported by Friedemann. Patients with intestinal or pharyngeal tuberculosis are totally unsuitable for sanocrysin treatment.

"(5) Injections of sanocrysin increase the catarrhal changes in the lesion and thus increase the alveolar sound. In dying patients, even a small amount of sanocrysin produces increased respiratory difficulty. Reinjection of sanocrysin after the improvement of the catarrhal change again engenders catarrh for four or five days. We are inclined to believe that these facts are indicative of the stimulating action of sanocrysin on the tubercular foci.

"(6) Sanocrysin may produce fever, skin eruption, vomiting, diarrhœa, etc., according to the amount injected and also depending on the individual peculiarity of patients. These points should be carefully regulated in using sanocrysin clinically. The use of large doses in a short period of time, as has been done by the originator and his associates, is not only dangerous but also productive of untoward effects. Little secondary effect is produced when small amounts of sanocrysin are injected with intervals of one week or more.

"(7) From the above results, we believe that sanocrysin is not a specific cure for tuberculosis, as claimed by the originator, but it should be regarded as a stimulant."

The Interpretation of Reports on the Cerebro-Spinal Fluid.

By J. G. GREENFIELD, M.D. (Edin.), F.R.C.P. (Lond.).

(*Lancet*, October 6, 1928, p. 716.)

THE examination of the cerebro-spinal fluid is now generally recognised as being of the greatest importance in the diagnosis of cases of organic disease of the nervous system. Sometimes this examination by itself enables an exact diagnosis to be made; more often it serves to indicate which of the two or more possible causes is the basis of the symptoms exhibited.

The Collection of the Specimen.

The examination should, for the patient's sake, only be made once, except in cases which may benefit by the repeated withdrawal of cerebro-spinal fluid. It should therefore be as complete as possible, and to this end the clinician as well as the pathologist must contribute. Complete asepsis is the first essential, and this applies as much to the collection of fluid as to the operation of lumbar puncture. A contaminated fluid soon changes in character and becomes worthless for diagnosis. Cells and sugar disappear, protein alters, and the fluid gives a fallacious Wassermann reaction. The tube in which it is received must therefore be as sterile as the lumbar puncture needle. Chemical cleanliness is almost as essential. Even the "fur" deposited by boiling instruments and tubes in hard water may upset some of the tests. Whenever possible, distilled water should be used, but water which has been boiled will serve. Attention should also be given to the tube used for the collection. It must be strong enough to withstand the risk of breakage in transit to the laboratory, and should be well stoppered, preferably with rubber or glass. Corks are at best dirty and are apt to form a collecting ground for cells and coagulum.

The amount of fluid to be taken depends partly on the case, and partly on the pathologist. In my experience it is not possible to make a satisfactory examination with less than 5 c.cm. and it is unnecessary to have more than 10 c.cm. even when the quantitative chemical examination is to include glucose, chlorides, urea, and protein. In cases of meningitis or uræmia in which drainage of fluid is beneficial a larger amount will be a convenience to the pathologist. Therefore, if the tubes are marked with a diamond at the levels of 5 and 10 c.cm. it is easy to steer a course between incomplete examination and excessive drainage of fluid.

The Determination of Pressure.

The manometric pressure of the fluid is of such importance that its estimation has become a routine procedure to many neurologists. It is true that an attempt to read the pressure rather complicates the operation of lumbar puncture, but the information it gives is often of the greatest value and can be obtained in no other way. This is especially true in cases of cerebral and spinal tumour where the diagnosis may sometimes be made from the pressure readings alone or from phenomena which are observed in the course of the examination, such as pain at the site of the tumour on jugular compression. It cannot be too strongly emphasised that the rate at which drops of fluid escape on lumbar puncture gives at best a fallacious and at times an altogether erroneous estimate of the fluid pressure. It is generally agreed that in this as in many other clinical examinations, the routine use of the method in normal cases renders abnormal readings more obvious and more convincing by making the limits of the normal more precise; the manometer should not therefore be reserved for the rare cases of cerebral or spinal tumour, but should be used in all cases where lumbar puncture is performed.

In taking a manometric reading it is essential that the patient should be lying on his side with the head at the level of the lumbar spine; he should be breathing easily with his muscles relaxed. Often at first the pressure rises slightly above the normal, but with the patient lying quietly and comfortably it falls in a minute or so to a steady level which is taken as the "initial pressure." Meanwhile the operator notes the dancing of the fluid with the arterial pulse and the slower but rather wider movements which occur with respirations. Normal pressures vary between 100 and 200 mm. of fluid. Pressures above 200 mm., if they cannot be attributed to embarrassment of respiration as in stout or nervous patients, indicate *increased intracranial pressure*. This may be due to cerebral tumour, œdema, or hæmorrhage, or to excess of fluid, as in meningitis or hydrocephalus. It is sometimes possible to distinguish cases of hydrocephalus from those of cerebral tumour or œdema by the observation that in the latter the pressure falls much more rapidly with the withdrawal of fluid. Thus after 3 or 5 c.cm. of fluid have been removed the pressure may have dropped to two-thirds or half of the initial pressure. In hydrocephalus, on the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

other hand, so small an amount of drainage produces little reduction of the fluid pressure. It is my rule never to reduce the pressure below two-thirds of the initial pressure, and although quite arbitrary this rule has so far stood the test of experience. The use of a manometer is therefore to some extent a safeguard, especially in cases of cerebral tumour, against the risk of too rapid and too great lowering of intracranial tension. Abnormally low pressures are sometimes encountered, but their significance has not yet been ascertained.

In cases of suspected spinal compression the "Queckenstedt test" is of great value. This consists in getting an assistant to compress the veins of the neck on both sides at first lightly and then, if necessary, more deeply. Normally even light compression causes the fluid to rise rapidly in the manometer tube, falling as suddenly when the pressure is removed. But when the space between dura mater and spinal cord is narrowed or obliterated by tumour or spinal caries or even by meningeal adhesions there is no rise of fluid in the manometer on light pressure and only a sluggish rise followed by an equally sluggish fall results on deeper pressure. Often the fluid does not return completely to the original level, or after rising slowly it may not fall at all when the pressure is relaxed. The latter phenomenon is practically diagnostic of a meningeal tumour. It appears to be due to the ball valve effect of a tumour in the spinal canal, and may be associated with an abnormally high initial pressure. In cases of complete blockage of the spinal canal the deepest jugular compression that the patient can stand, fails to cause any rise of fluid in the manometer tube.

Naked-eye Examination of the Fluid.

Yellow colouration, however slight, is abnormal and indicates either pre-existing hæmorrhage or excess of protein or both. The formation of a *coagulum* on standing is also a valuable indication. In a clear colourless fluid it is characteristic of meningitis, especially the tuberculous and syphilitic forms, or of poliomyelitis. When occurring in a yellowish fluid it indicates considerable excess of protein along with some cell increase.

When a specimen of cerebro-spinal fluid is sent to a pathologist for examination it is advisable that he should be told as much about the clinical nature of the case as possible. This is much better than merely asking him to perform certain tests on it, as most pathologists nowadays are fully conversant with the examination of the cerebro-spinal fluid, and the decision as to the methods of examination to be employed should rest with them. But unless the clinical nature of the case is known some important examination may be omitted or left so late that insufficient fluid remains for the test. The more important lines of examination may, however, be indicated. These will depend on whether the case appears to be one of cerebral or spinal disease and on the acuteness of onset and course of the malady. In every case a total and differential cell count, and an examination for total protein and globulin excess should be made. Where there is any possibility of septic infection a cultural examination and an examination of stained films for organisms should be asked for; these examinations should be made as soon as possible after the fluid is obtained.

In the more acute cerebral conditions it is usually wise to make a fairly complete quantitative chemical examination including estimations of chlorides, glucose, and urea. In suspected meningitis also the chlorides and glucose should always be estimated, as the degree of reduction of these substances gives an indication of the severity of the disease. An estimation of the urea has often proved that cerebral symptoms were due to unsuspected uræmia, a condition in which there is usually also a rise in the chloride percentage. It is a well-established fact that the urea percentages are always identical in the blood and the cerebro-spinal fluid. Consequently the examination of the one makes that of the other unnecessary. In spinal lesions and in many of the more chronic cerebral conditions these chemical examinations are unnecessary, but a Wassermann reaction should almost always be performed and one of the colloidal reactions (gold, benzoin, paraffin, or mastic) may help to distinguish the type of syphilitic lesion or, in the presence of a negative Wassermann reaction, may indicate that the case is one of disseminated sclerosis.

The minimum examination therefore that may be considered complete in a spinal case or in a chronic cerebral case includes: (1) total and differential cell count (0.5 c.cm.); (2) estimation of total protein (1 to 2 c.cm.); (3) one or more tests for glubulin excess (0.5 c.cm.); (4) Wassermann reaction (1 to 2 c.cm.); (5) a colloidal test (0.1 to 1 c.cm.). Thus 5 or 6 c.cm. of fluid are quite sufficient for all these examinations.

X-Ray Diagnosis.

(*Brit. Med. Journ.*, October 6, 1928, p. 617.)

THERE is one real fallacy connected with *x*-ray work which has grown with the development of radiology, and to a large degree exercises a crippling influence even to-day. Its consequences have been disastrous and far-reaching. It has existed since the beginning, when radiology was looked upon as an interesting toy of the medical profession, when sapient physicians and surgeons impressed upon hospital committees that, of course, the hospital must have some sort of quarters for an *x*-ray apparatus, but that, equally of course, anyone—medical, pharmaceutical, or otherwise—was good enough to "run the show" as long as he did not spend too much money and was also duly impressed with the diagnostic acumen of his colleagues. This is the false idea which even now survives. No hospital, of whatever kind or size, is regarded as complete unless it possesses an *x*-ray plant of sorts and an *x*-ray department. Money can always be found for these. Then the question, the quite secondary question, arises as to who shall take charge of the department and be responsible for its work. In the old days any enthusiast who offered his services was promptly accepted; even now in far too many places the hospital authorities consider that any medical man—or perhaps a layman—is fully qualified, without any special knowledge and without any special training, to be put in charge of the radiological department.

The fallacy—a serious one—is, therefore, that special knowledge is not required to qualify for the very responsible post of officer-in-charge of a hospital *x*-ray department.

Technique is the first essential for accurate *x*-ray work. Without it the finest radiological diagnostician must make numerous mistakes; with it his mistakes will be lessened in number, for none of us is infallible, and no method of diagnosis is free from risk of error. The other point, so often overlooked, is that even with the finest technique a man's opinion is apt to prove unreliable unless he has a very comprehensive knowledge of diseases and of the pathological conditions which can give rise to the various findings seen on a screen or recorded on films. The fact that it is possible nowadays to get such magnificent radiographs has made interpretation even more difficult than in the early years of radiology. Much slighter deviations from the normal are relied on as evidence of disease, and more remote regions of the body have been explored. Perhaps the greatest difficulty at the present time is to find specially qualified medical men or women for all these hospital posts.

We cannot agree with those who say that there is no such thing as an *x*-ray diagnosis. A mere glance on the screen sometimes suffices, while over and over again in practically all the conditions for which an *x*-ray examination is made the films alone show, beyond dispute, what the pathological condition is. Probably, indeed, no other special method of examination will by itself yield so many positive diagnoses as will the *x*-ray method. This, however, is not said with a view to urging that purely *x*-ray diagnoses should be the rule, and we cordially agree that consultation between the practitioner in charge of the case and the radiologist is of the utmost value; if this were always possible many mistakes would not be made.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The League of Nations and Opium.

(*Brit. Med. Journ.*, October 20, p. 711.)

THE Geneva Opium Convention of 1925 came into force on September 25th, 1928; it is now incumbent on the Council of the League of Nations to appoint a Central Board, within three months, to undertake the prescribed duties in regard to international commerce in the substances covered by the Convention, and to arrange for the organization and working of the board and its staff. Provision had been made for the United States Government to appoint one member of the new Central Board; but, in accord with the attitude taken up at the Geneva conferences in 1924-25, from which the United States delegates eventually withdrew, the Council's invitation to participate in the selection of the board has been declined. The reason assigned for this refusal is the inadequacy of the Geneva Convention in regard to limiting the production of raw opium and coca leaves to the medicinal and scientific needs of the world. The United States Government holds that until there can be devised some substitute for the Hague Convention more satisfactory than the Geneva Convention, the eradication of the abuse of narcotic drugs would be more likely to be achieved by strict observance of the provisions of the Hague Convention. The United States will, however, in addition to observing its obligations under the Hague Convention, endeavour to furnish information as the permanent Central Board may request. Meanwhile, at the recent meetings of the Council and Assembly of the League, considerable discussion was aroused by the proposal of the British Government, to set up a fresh commission of inquiry to examine the conditions of opium-smoking and the illicit traffic in opium in the Far East. Objection was taken by representatives of several countries to the expense with which such an inquiry would burden the League, and at first the proposal had a very cool reception. When the French representative urged that the investigation should include China, the Chinese delegate demurred, unless, indeed, the inquiry should cover the commerce in derivatives of opium exported to China from European countries. This inquiry is deemed essential in view of the decision to hold a further conference on opium-smoking in the Far East in 1929. It will be remembered that the Hague Convention of 1912 bound the contracting Powers to bring about the gradual and effective "suppression" of the commerce in opium "prepared" for smoking; whereas the Geneva Convention made such suppression dependent on the prior elimination of smuggling. There can be no doubt that the trade in prepared opium, both licit and illicit, continues to flourish in the Far East. The Federated Malay States, the Straits Settlements, Brunei, and British North Borneo derive no inconsiderable percentage of their revenue from opium-smoking. Further inquiry may be necessary, but action in accord with treaty engagements would seem to be urgently required.

Low Back Pain.

By JOHN T. O'FERRALL, M.D.

(*Journ. Amer. Med. Assn.*, August 25, 1928, p. 532.)

THE subject of this paper suggests the reason for an extremely large number of patients now under treatment by physicians in all branches of medicine and surgery, from the rural physician to the most highly trained specialist. It is at once obvious that the available space hardly permits of even a brief mention of the numerous causes of low back pain, to say nothing of a discussion of them. The frank symptoms of fractures of the spine, ostearthritis, malignant metastases, and Pott's disease are so well-known that they need only be called to mind in passing. The pains in the lower spinal segments ascribed to focal infections, pelvic or uterine disorders, prostatic enlargement, whether malignant or benign and syphilis represent subjects of much importance worthy of prolonged individual discussion.

It has seemed to me that, in the past, too much stress has been laid on bony abnormalities of the low spine as an explanatory cause of many backaches, and that the rôle played by the soft parts in their causation has been, to some extent, slighted. It is also believed that the relationship of the various bony structures to one another and to the attached soft parts has not received the consideration deserved.

CONCLUSIONS.

1. The majority of the acute and many of the chronic backaches occur in young adults below the age of 45 as a result of sprain of the lumbosacral ligaments.
2. The strain occurs more frequently in males engaged in laborious work, athletes and others in awkward posture, namely, flexion, semi-flexion and twisting of the torso, especially on impending muscular effort, as lifting and pushing.
3. The lumbosacral joint is normally a most unstable joint and in studying its anatomy insufficient emphasis has been placed on the ligamentous "guy-rope" and the relation of the bony structures to one another, whereas undeserved importance has been given to the bony abnormalities.
4. Gross pathologic changes exist, as hæmorrhage, fibrous adhesions or pannus formation and swelling of the ligaments with pressure on the lumbosacral cord and other parts of the lumbar plexus, protective tonic spasm of the lateral spinal muscles from nerve pressure, and often toxic absorption.
5. Flat röentgenograms are of little value. Stereoscopic and lateral views of the joint are very helpful and probably essential.
6. Treatment to be effective must represent fixation of the lumbar spine to the pelvis, thoroughly carried out and prolonged for a sufficiently long time to permit healing of the truly sprained ligament and resolution of the pathologic changes that usually occur.

Reviews.

HANDBOOK OF DISEASES OF THE EAR FOR STUDENTS AND PRACTITIONERS.—By Richard Lake, F.R.C.S. (Eng.) and E. A. Peters, M.D. (Cantab.), F.R.C.S. (Eng.). Fifth Edition. London: Baillière, Tindall and Cox, 1927. Pp. xviii plus 310, with 4 coloured plates and 80 figures in the text. Price, 12s. 6d. net.

THIS, the fifth edition, is much the same as its predecessors in general get up. A noteworthy feature of the book is the chapters on the anatomy of the ear. A most excellent account is given of the physiology of the internal ear with special reference to the newest work on the utricle and saccule and the semi-circular canals. The account of vertigo is specially good. The chapters on the operative surgery of the mastoid are also well done. On the whole, for a book of its size, an adequate account is given of the ordinary diseases of the ear, and the book should be a very useful one to those who have not the time for a more elaborate treatise on the subject.

N. J. J.

THE ART OF ANÆSTHESIA.—By Paulel J. Flagg, M.D. Fourth Edition, Revised. London: J. B. Lippincott Company. Pp. 384, with 135 illustrations. Price, Rs. 15-12. Obtainable from Messrs. Butterworth & Co. (India), Ltd., Calcutta.

THE "Art of Anæsthesia" is a lucid and well illustrated volume on the subject of anæsthetics and contains a full description of the nature of anæsthesia, the physical signs of the anæsthetised patient, the dangers involved and the danger signals, the various forms of anæsthetics used,—both general and local,—and the relative merits of the various anæsthetics.

A short introductory chapter deals mainly with the history of anæsthetics in which but little reference to the English pioneers of the art is made, and one might think

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

anæsthesia to be a physical state of entirely American origin.

On the whole it is doubtful whether the book will appeal to readers of English medical literature. It is written in an American style and with reference to American methods which differ in many respects from those in vogue in England. The apparatus described too, is in some cases unfamiliar to the English student. It is, however, certainly an advantage to be enabled to compare the types of apparatus employed in the two countries.

The chapter on the signs of anæsthesia is well written, and indications such as danger signals are well described. A good account is given of the intratracheal, intravenous and rectal methods of administration of anæsthetics.

No mention is made of contra-indications to certain of the common anæsthetics in the various constitutional diseases, such as Bright's disease and diabetes.

T. H. T.

THE CAUSES OF ANTE-NATAL, NATAL AND NEO-NATAL MORTALITY OF INFANTS.—By A. L. Mudaliar, B.A., M.D. Madras: Associated Printers (University Madras Publications). Pp. 83.

"THE Causes of Ante-Natal, Natal and Neo-Natal Mortality of Infants" by A. L. Mudaliar, B.A., M.D., consists of three lectures which are elaborated by 14 graphs, and several tables and statistics at the end. The author is to be congratulated on the vast amount of painstaking care and trouble expended in their preparation. It would be easier for the reader to follow the graphs if they were labelled as in the text—Graph I for Hospital A and Graph I for Hospital B. The chart showing the causes of neo-natal mortality in 1,039 cases is open to the criticism that many of the causes of death are more symptoms than causes, e.g., tympanites, pyrexia, etc. This chart is of very little value because, as the author says, "the cause of death could not be accurately ascertained" in the absence of post-mortems.

The second and third lectures consist of discussions on the effects of various constitutional diseases, infectious fevers, malpresentations, antepartum hæmorrhage, eclampsia, etc., in pregnancy. We think that the large part played by eclampsia and nephritic toxæmia is not sufficiently emphasised.

The monograph contains much that is sound teaching, modern and well considered and will well repay the reader for studying it. It is excellently printed and published by the Associated Printers, Madras.

S. A. McS.

MONGOLISM: A STUDY OF THE PHYSICAL AND MENTAL CHARACTERISTICS OF MONGOLIAN IMBECILES.—By Kate Brousseau. Revised by H. G. Brainerd, M.D. London: Baillière, Tindall & Cox, 1928. Pp. viii, plus 210, with 37 figures in the text besides Tables and Charts. Price, 20s. net.

THIS book epitomises our present knowledge of that peculiar variety of mental defect associated with certain well marked physical characteristics which goes by the name of mongolism. The earliest literature on mongolism appeared in England and in America where the type was first recognised as distinct from other forms of idiocy. The first definite description was given by J. Langdon Down in 1866, when he classified the feeble-minded according to their resemblance to ethnic groups, one of which he named the mongol. Dr. Brousseau cites seven theories of the etiology of mongolism, of which she rejects all but one, namely, that mongolism is possibly induced by some obscure disturbance of the ductless glands. She thinks that there may be some inherited or congenital glandular instability or that the mother may develop during pregnancy certain endocrine disorders which may be transmitted to the child. Further investigation may show that mongolism is the result of a pluriglandular syndrome or of the dysfunction of some particular gland because some endocrine disturbance can be demonstrated in every mongol. In mongolism, as in cretinism and achondroplasia, the body is undersized due to a shortening of the long bones, but these shortened long bones are slender and fairly well formed and show none of the irregularities in growth which characterise the long bones of cretins and achondroplasics. Although mongolism, sporadic cretinism, achondroplasia and rachitis are so markedly different both clinically and pathologically, yet many cases, especially in infancy, present certain resemblances, for the most part superficial, that often cause confusion in diagnosis. Not only scientifically but practically, a correct diagnosis is of great importance since the treatment depends upon an exact diagnosis. As yet no treatment has produced any appreciable change in mongolism and achondroplasia but a correct diagnosis is essential if only to spare parents the disappointment of expecting relief from glandular or other medication that might prove of value if the case were one of cretinism or rachitis.

O. W. B. H.

METHODS AND USES OF HYPNOSIS AND SELF-HYPNOSIS.—By Bernard Hollander, M.D., M.R.C.S., L.R.C.P. London: George Allen and Unwin, Ltd., 1928. Pp. 191. Price, 6s. net.

THIS book does not add much, if anything, to our present knowledge of hypnosis. Dr. Hollander describes the hypnotic state as "a state of exaltation and abstraction" and then leaves his reader to guess what this may mean. The author is more or less in agreement with the views of Bernheim and Sidis that the essential feature of hypnosis is a dissociation of consciousness, but he shares the common error that this dissociation is an artificial state brought about by the hypnotic procedure. Thanks mainly to the work of Freud, we not only know that psychical dissociation is a characteristic of every mind, but also that even in the so-called normal mind the dissociated trends constantly produce manifestations by means of the same psychological mechanism as those underlying hysterical symptoms. With a fine disregard for the light which psycho-analysis has thrown upon the relation between hysteria and hypnosis, Dr. Hollander discusses what he terms the "supernormal phenomena of hypnosis" and never once alludes to the fact that much of what he describes under this caption, has already been studied and described in persons suffering from hysteria. It is only possible to account for this confusion of ideas by noting that Dr. Hollander regards hysteria as a product of "self-hypnosis"! Like so many other professional hypnotists, Dr. Hollander is inclined to exaggerate the therapeutic value of hypnosis. He admits that relapses do occur in patients who have been treated hypnotically but he holds that relapses are not more frequent in hypnotic than in other forms of treatment and goes so far as to maintain that "no other treatment can effect so many rapid and lasting cures." He believes that relapses occur when "ideas are presented to the patient which are not adapted to his individuality." Whatever therapeutic effect hypnosis does produce it is certainly not due to "ideas" passing from the physician to the patient but to the release, while in the hypnotic state, of repressed desires that are finding expression in the form of symptoms and their consequent attachment to the idea of the physician, and this is really nothing else but the replacement of one symptom by another.

O. W. B. H.

HANDBOOK OF SANITARY LAW.—By B. Burnett Ham, M.D., D.P.H. (Camb.). Tenth Edition. London: H. K. Lewis and Co., Ltd., 1928. Pp. xxxii 284. Price, 6s. 6d. net.

THE first edition of this excellent handbook was published in the year 1899 and within 10 years five more editions were published. Since the year 1910 another five editions have been published: in the intervening period of the Great War no fresh edition could be published for 7 years. Since the war and during the last 7 or 8 years 27 new Acts have been passed, and 14 old Acts have been repealed. The edition under review has been, therefore, carefully revised and brought up-to-date. The chapters on "Housing of the Working Classes," "Food" and "Education and Child Welfare" have been entirely re-written, in the light of recent legislation. Several other chapters have been recast, and sections of various

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Acts placed under the appropriate headings to which they have reference.

"Sanitary Law" is a very important part of the curriculum for the examination in the Diploma of Public Health. The numerous Acts, orders, bye-laws, regulations, etc., relating to "Sanitary Law" lie scattered in the text-books on hygiene and public health and, are therefore, difficult of access. The difficulty of the student is, therefore, removed by this little book in which a very successful attempt is made to collect and condense under various headings the whole of the law bearing upon public health as applicable to England and Wales.

To an Indian student preparing for his D. P. H. examination, this book is particularly very helpful because the Indian legislation relating to public health is based more or less on the English legislation. Even after passing his D. P. H. examination, when he is appointed a Medical Officer of Health, he has to keep himself well-informed and fully acquainted with the ever-increasing and amending legislation, and this book will fully supply his wants at very little expense. His labour will be amply rewarded if he studies this book carefully. In the appendix he will find appointments and duties of Medical Officers of Health and Sanitary Inspectors, and he will learn much by comparing the duties laid down by various provincial enactments in India.

R. B. K.

A SHORTER ANATOMY.—By E. Wolff, M.B., B.S. (Lond.), F.R.C.S. (Eng.). London: H. K. Lewis & Co., Ltd., 1928. Pp. viii plus 451, with 130 illustrations. Price, 18s. net.

"A SHORTER Anatomy" is a small volume containing 440 pages of text, and as such is intended to bring down to a narrower compass the lengthy subject of anatomy. The author states in the preface that it is intended principally for those revising their anatomy for the final examinations, but hopes it may prove useful to students at any stage of their course.

The subject-matter is systematically arranged and divided primarily into sections each of which deals with an anatomical region. Each section in turn is subdivided into sub-sections dealing with bony landmarks, nerves, vessels, joints and muscles. Additional sections are given on the vertebral column, and on ossification and epiphyses. The book thus aims at covering the whole field of gross anatomy with the exception of osteology.

The old nomenclature is used, but where the new differs from this it is given in brackets.

The knowledge of anatomical detail required for both the ordinary and the higher examinations in anatomy is considerable, and students presenting themselves for these examinations will require greater accuracy of description and greater attention to the finer points of anatomical relationship than is contained in this considerably abridged volume. One cannot, therefore, entirely sympathise with the author's hope that the book may be of use to a student in any stage of his course except as a supplement to other books. On the other hand there is a great dearth of books on anatomy suitable for students and practitioners presenting themselves for the final and higher examinations in medicine and surgery. Volumes on surgical and medical anatomy are as a rule too brief—and the larger anatomical books far too unwieldy. It is for this latter class of individual therefore that the book is especially suitable. Practical applications to surgery and medicine are given throughout the text in italics.

The transition from the old to the *Basle* nomenclature and the subsequent partial reversion to the old has led to a mixed terminology being used in modern anatomical text-books, which is undesirable. The present volume is not free from this confusion. What was of yore the anterior crural nerve is referred to on page 89 as the femoral nerve with "anterior crural" appended in brackets whilst the same nerve on page 92 is called the anterior crural with "femoral" in brackets. This is only one instance of a defect that pervades the book. It appears to be a matter of some importance that the modern student should at least know which is the old and which is the new nomenclature.

There are many exceedingly useful illustrations which are clearly portrayed.

Apart from the defects mentioned the book is certainly to be recommended for those requiring to study anatomy as an adjunct to medical and surgical studies for the final and higher professional examinations.

T. H. T.

MOSQUITOES IN RELATION TO DISEASE—INSTRUCTIONS FOR FIELD SANITARY OFFICERS.—By M. O. T. Iyengar. Calcutta: Bengal Government Press, 1928. Pp. 16, with 9 plates.

THE professed purpose of this pamphlet is amply fulfilled. It contains all that the Field Sanitary Officer should know and very practical directions for much that he will have to do.

It is divided up into 11 sections, 7 of which seem to come within the ambit of "principle." and—within that of "practice," and if one may add a word of criticism arising out of the arrangement of the paper, it is that section 2—How to differentiate between the common forms of mosquitoes—should have been placed in juxtaposition to section 10 on the Identification of Bengal Anophelines. There was no reason to separate these essentially cognate matters.

The illustrations are to the point and very well done.

C. S.

LYON'S MEDICAL JURISPRUDENCE FOR INDIA WITH ILLUSTRATIVE CASES.—By L. A. Waddell. Eighth Edition. Calcutta and Simla: Thacker, Spink and Co., 1928. Pp. xvi and 842. Price, Rs. 20.

LYON'S Medical Jurisprudence is too well-known a book to need any general description, but in this new edition there are several changes and improvements and in some parts it is a pity there are not more. These have been made possible by the enlistment of several particularly well-chosen assistants. The greater part of the new additions are due to Colonel Owens—who is somewhat fulsomely described in the preface as "*facile princeps* the foremost medical jurist in India." In many respects he undoubtedly is, but why gratuitously insult others who are engaged in medical jurisprudence work in India by the insertion of *facile princeps?* One of the good features in this new edition is the introduction of numerous photographs from Colonel Owens' collection, which make clear many points better than any amount of written description. Colonel Owens has also revised the chapters on the examination of the dead body, and wounds, and added new and useful chapters on the responsibility of an intoxicated man for his acts, on accident insurance and the Workman's Compensation Act and on gunshot wounds. All this part is excellent, as is also the chapter on blood-stains by Colonel R. B. Lloyd. In this chapter the hæmochromogen test for blood might have been included, as, in the reviewer's opinion, in some cases (blood-stained earth and blood-stains on fabrics the dye of which gives a spectrum which obscures the blood spectrum) this is an easier and more satisfactory test than the cyano-hæmochromogen test described. This is, however, a matter of opinion—chacun à son goût—and must not be taken as any detraction from a chapter which as a whole seems to the reviewer all that it should be. The latest investigations of the subject are included and references to recent literature are given. It is written so that a layman can follow the general principles of the various tests and the expert will find it no less useful. The illustration of the blood spectra is a very poor one and the chapter deserves a good coloured plate.

It is a pity that the chapter on Seminal Stains could not have been included in the revision of the blood-stain chapter. The only certain identification of semen is by finding the spermatozoa (and this is only certain when they are found by someone practised in identifying them) but Florence's test is invaluable as a sorting test and is further, at least as good a positive test for semen as many tests relied on for the identification of poisons.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Of this test there is no mention. The putting of Hankin's method as a routine procedure is also, we think, a mistake. It no doubt gave excellent results in the hands of Mr. Hankin but it does not work so well in the hands of others and is altogether too long and cumbersome.

It is in the part of the book dealing with toxicology that a comprehensive revision is most needed and has been least attempted. In a book designed for India where poisoning is so common, one would expect this part to be specially strong. References to recent chemical literature on the subject are here almost non-existent, and the references to cases are mostly before 1900. This is specially noticeable in the figures for the frequency of the various poisons, which, with the exception of a few recent figures for Burma only, are mostly derived from Chemical Examiners' Reports of 40 or 50 years ago. The whole of this part needs a thorough revision and such a revision would be no easy task. We notice, for example, that the paragraphs on ptomaines have been left as in the previous edition, even to an obvious misprint in the second line (found for formed)—ignoring completely a large amount of recent work on the subject and the generally accepted conclusion that ptomaines in the original sense do not exist. In the chapter on arsenic there is no mention of Chapman's work on the arsenic content of fish, to recent improvements in Marsh's test (beyond a bare mention of an electrolytic Marsh's test which is credited to Bloxam) or to the many difficulties in the old test; while Gutzeit's test is not mentioned at all. Under Indian Hemp there is no mention of Bean's test. Numerous other instances might be given.

Amongst the few places where this part of the book has been revised are some excellent new paragraphs dealing with the Cocaine and Morphia Habits and Opium Eating.

A completely new chapter on Life and Accident Insurance by Dr. E. Houseman, not only deals adequately with the subject but contains new matter of great scientific interest. In this chapter a contradiction is given to the statement on p. 52 that "there are no special Indian observations on the relation of height and weight to age."

The two chapters on Unnatural Sexual Crimes and Leprosy in Relation to the Law which in this edition are stated to have been revised by Professor A. Powell appear to be exactly as in the previous edition.

The book is one which everyone who has to deal with Medical Jurisprudence in India must have, and if our criticisms of some parts have seemed carping they may be taken as an appreciation of the excellence of other parts and of the book as a whole.

ADDRESSES ON SURGICAL SUBJECTS.—By Sir Berkeley Moynihan, Bart. Philadelphia and London: W. B. Saunders Company, 1928. Pp. 348. Price, 28s. net.

THIS book contains fourteen addresses on surgical subjects by a very great surgeon, who imparts his lofty ideals and faith in the sacred mission of his art in beautiful, flowing, and resonant prose. The central theme of most of the addresses is that supreme excellence in the art of surgery is not enough, but that surgery is the most powerful weapon of research which reveals the "pathology of the living" and has revolutionised our conceptions of diseases of the stomach, duodenum, gall-bladder, and pancreas.

Sir Berkeley rightly stresses the importance of co-operation between surgeon, physician, pathologist, bacteriologist, radiologist, chemist, and biochemist, if the best results are to be obtained from surgery.

Too seldom is the scene of our endeavours, the operating theatre, graced by the presence of our brother physician or research worker, who by their expert advice could help to elucidate our problems, suggest new methods of approach and help to instigate research on lines dictated by the actual findings in the living. The address delivered before the American College of Surgeons at Montreal on "John B. Murphy, Surgeon" contains one of the greatest perorations which we have ever read. Masterly descriptions of the various conditions grouped together as the acute abdomen are given in the address on "Perforation of Gastric and Duodenal Ulcers." There are also excellent addresses on "Acute Pancreatitis," and "The Gall bladder and its Infections."

In many of the addresses Sir Berkeley voices the feelings of all in unstinted admiration of the two greatest surgeons of all times Lister and Hunter.

The book is well printed, cheap, full of thought, bears the stamp of greatness and should adorn the library of every member of our profession.

H. G. A.

LOCAL ANÆSTHESIA.—By Geza de Takats, M.D., M.S. Philadelphia and London: W. B. Saunders Company, 1928. Pp. 221. Illustrated. Price, 18s. net.

THIS book of 200 odd pages presents in a very readable form the salient points of Local Anæsthesia.

It is really a series of lectures on the subject given to a post-graduate course by the author with dissections on the cadaver and practical demonstrations.

The first two chapters deal with the local anæsthetic drugs used, the types of local anæsthesia, the advantages and disadvantages of local anæsthesia, the preparation of the patient, instruments, and of the solution. Separate chapters describe the various methods in the head, neck, thorax, abdomen, subperitoneal organs, upper extremities and lower extremities.

Only those methods which are free from risk are advocated by the author, and one notices that he does not recommend the paravertebral route for this reason. After describing each method, he presents the percentage of success and failure attending it and gives his advice as to its adoption or not. He recommends the ordinary Record syringe with needles ranging from 3 cm. to 12 to 15 cm. in length, and states that 250 c.c. of a ½%, 100 c.c. of a 1%, and 40 c.c. of a 2% solution of novocain should not be exceeded. He advises the use of adrenalin mixed with the novocain solution in dosage which varies in different fields, because its use decreases the toxicity of novocain by producing more gradual absorption. There is undoubtedly great scope for this type of anæsthesia particularly as an auxiliary to general anæsthesia. In Calcutta we have had excellent results in upper abdominal work with "abdominal field block" combined with "anterior splanchnic anæsthesia" and a minimum of open ether.

The book is well printed and illustrated with a good index, and we cordially recommend it.

H. G. A.

SCIENTIFIC REPORTS FROM THE GOVERNMENT INSTITUTE FOR INFECTIOUS DISEASES, TOKYO. —Vol. VI, 1927.

THE Scientific Reports from the Government Institute for Infectious Diseases, Tokyo Imperial University, Japan, for the year 1927 are bound together in a stout volume of over 600 pages. They are divisible into seven sections comprising the subjects of Bacteriology and Serology, Pathology, Biology, Biochemistry, Clinical Medicine, Parasitology and Protozoology, and lastly Medical Entomology. It is impossible in a short review to give even a brief account of the variety of subjects dealt with but special mention must be made of the work of Watanabe, Sato and Miyagaza on Sanocrysin. Their results do not bear out the claims of Möllgaard and his school regarding the specific action of this compound on tuberculosis and in this respect they agree in the main with those of numerous other independent workers. S. Kishino records some interesting experiments on the influence of certain salts on the growth of typhoid bacilli. T. Tamiya contributes some important studies on thermal influence upon the Wassermann reaction with a description of the so-called freezing-point method. S. Hosoya and S. Kishino describe and figure a new apparatus for cultivating anærobic bacteria as isolated surface colonies.

In the biological section K. Saito carried out an experimental study on the origin of the œstrous hormone, while in the sections of Protozoology and Parasitology

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and of Medical Entomology important work has been done on dog-filariasis and on Japanese mosquitoes as intermediate hosts for *Filaria bancrofti* (Cobbold).

The above notes indicate the extensive range of work carried on in Tokyo: a study of the full papers will repay the research worker.

J. M. H.

CANCER, THE SURGEON AND THE RESEARCHER.—By J. Ellis Barker. London: John Murray, 1928. Pp. xii—483. Price, 7s. 6d. net.

THE main feature of this book is an attack directed against the surgeon and the research worker who have apparently formed themselves into a union against Mr. Ellis Barker and his work. Who these leaders are, and why they should devote their energies against him is not obvious from reading the book. The mere fact that Mr. Barker is a layman does not appear to be a sufficient reason. One must remember that when a layman speaks on a difficult technical subject, there are bound to be numerous errors that he will make and which are bound to be attacked, not from any personal motive, but purely on account of the fact that he is not able to assess the value of the evidence.

All through the book, these workers are abused as being ignorant, wasteful, etc., but whenever their work coincides with Mr. Barker's views the surgeon is hailed as good, eminent or far-seeing. Mr. Barker has apparently only recently heard that cancer can undergo spontaneous cure.

In the book, we learn that homœopathy and Abrams' box can cure cancer: if this were really so, two years would be quite sufficient to establish the reputation of either method without any press puff. The medical profession cannot stand aside and refuse to recognise any cure.

Mr. Barker has still much to learn, for the quotations that he gives are regarded as gospel truths, and not merely something that has been written in a book or in a paper. The value of such evidence depends a good deal on the integrity of the author. There are human beings who are apt to exaggerate or be biased, and when they write, a few cases become hundreds. Again he does not realise the difference between the partial association and the true causation. The real object of the book is the prevention of cancer by dietetic methods, but no details are given except the views of the writers.

A lacto-vegetarian diet consisting of fresh fruit, salads, wholemeal bread, milk, etc., which are rich in vitamines and mineral substances, is recommended as a preventive measure against cancer. The introduction is by Sir Arbuthnot Lane, the eminent surgeon whose fame is associated with the surgical treatment of intestinal stasis, and there we are informed that cancer is a disease of faulty feeding, and not a mysterious disease that can be fathomed only by eminent scientists who have specialised in microbiology, chemistry and other sciences.

In reading through the book the paste and scissors work which Mr. Barker has done gives us very little real help in elucidating the cause of cancer. The book has obviously been written to increase its sale by controversy, and we trust that the money Mr. Barker obtains will be used to test his own ideas, such as they are, and give humanity the answer to the long sought for solution of the cancer problem. Mr. Barker can rest assured that he will gain, not only the praise he has already given himself for his solution of the cancer problem, but also that of those hard-hearted ruffians, the cell probers and the microbe hunters, who, although corrupt, are still able to distinguish truth from falsehood.

MEDICINE: Vol. VII, No. I, February and No. II, May, 1928.—Published Quarterly. 500 pages to the volume. Baltimore: The Williams and Wilkins Co. Subscription Price, 23s. 6d. net, post free per annum. English Agents: Baillière, Tindall and Cox, London.

ONE can scarcely apply the word journal to this publication. Although it is published in the form of a journal at regular intervals the bound volumes will constitute more of an encyclopædia on the subject of general medicine, neurology and pædiatrics than a journal in the ordinarily accepted sense. Each number consists of an analytical review, or analytical reviews, of one or more subjects. The authors are masters of their particular subjects. The numbers are issued quarterly and each volume consists of 500 pages. Number I of this year contains articles on three closely allied subjects; their titles are "Hyperplasia of Lymphoid Tissue and Lymphocytosis," "Experimental Study of the Leucemias and Lymphatoma," and "A Review of the Treatment of the Lymphatic Leucemias and Related Diseases especially by Irradiation." Number II is a most excellent monograph, of about 150 pages, on epilepsy.

The printing and paper are good, and the diagrams and illustrations are clearly reproduced. We can recommend this publication to any physician who wishes to keep abreast of the times and to acquire a "system of medicine" which will be valuable to him for the rest of his career.

L. E. N.

A POCKET MEDICAL DICTIONARY.—By G. M. Gould, A.M., M.D. London: H. K. Lewis and Co., Ltd. Ninth Edition, Revised. Over 40,000 words. 1928. Price, 10s. net.

THIS is the ninth edition and the fifty-seventh reprinting of this very useful little dictionary. The words are clearly printed in bold-face type, they are then respelled phonetically in italics and are followed by a very brief definition. As far as one can see the only point that has been sacrificed in order to make the dictionary a pocket one is the definition; this usually consists of only a few words but is in most instances sufficient. The print is clear and not too small and the paper is very thin but opaque. The binding is very satisfactory; it appears to be quite strong, yet the book will lie open on the table and the pages are easy to turn, that is to say they do not stick together. The case is a flexible one and very suitable for a pocket dictionary. The term "pocket" is certainly justifiable, but anyone who is at all fastidious about the shape of his pockets would not, we feel sure, care to carry this book in them for any length of time.

Another feature of this book is the numerous extremely valuable tables which are to be found in their suitable places throughout.

A reviewer in a tropical country naturally first looks up words which are current in tropical medicine; we did this and were very disappointed. "Sleeping Sickness" is described as "a peculiar disease characterised by increasing somnolence. *Encephalitis lethargica.*" There is no mention here of trypanosomiasis. The words "Sleepy Sickness" have, we believe, been applied to encephalitis lethargica, but surely for many decades the name "Sleeping Sickness" has been used in reference to the African disease. Trypanosomiasis is given and justice appears to have been done to the genus Trypanosoma, but there is no reference to Leishmania, as a genus, nor is the word Leishmaniasis given. "Leishman-Donovan Bodies" is defined as *Piroplasma donovani; Leishmania donovani.* Small parasite-like bodies found in the liver and spleen of patients suffering from kala-azar." There is no mention of any other species of Leishmania. For the definition of oriental sore we are referred to "Furunculus orientalis," which we find is "a disease of the face in the Orient with a circumscribed ulcer on the cheek or at the angle of the mouth." Blackwater fever is described as a "fatal contagious disease of the tropics." We would like to suggest that before the next edition of this book appears it should be revised with the aid of the latest edition of Manson's, or some other book on tropical medicine.

L. E. N.

FILTERABLE VIRUSES.—By Various Authors. Edited by T. M. Rivers. London: Baillière, Tindall and Cox, 1928. Pp. ix plus 428, with 15 plates and 26 figures. Price, 34s. net.

THE filterable viruses are not quite anybody's child. There is a little to be found about them in books on

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

DURING LACTATION

The Importance of Vitamin B

"It has been proved that efficient lactation is only secured by three to five times the amount of Vitamin B in the diet as is needed by the adult animal."

—*THE PRACTITIONER, July, 1928, p. 23.*

Experiments have demonstrated further that a deficiency of Vitamin B in the diet causes invariably a loss of appetite; whilst conversely an increase of Vitamin B in the diet produces a correspondingly-important increase in the food intake, and brings about a better assimilation and utilization of it.

The necessity, therefore, of a regular optimum supply of Vitamin B in the mother's daily diet during lactation cannot be too strongly emphasised, particularly in view of the fact that the human body does not store Vitamin B as it stores Vitamin D.

There is present in Radio-Malt an ample and properly-balanced proportion of Vitamin B, standardised in a scientific manner by physiological test.

Radio-Malt has the added advantage of containing also accurately-measured proportions of Vitamins A and D, both of which accessory dietary factors are a necessity to the nursing mother. Radio-Malt, therefore, produces the greatest possible benefit in both mother and child.

In no part of its manufacture is Radio-Malt touched by the hand.

RADIO-MALT

(Containing vitamins A and D as well as vitamin B)

Descriptive literature will be sent on request to either of the B.D.H. representatives in India:

HENRY S. CLARK
8/10, Waterloo Street
CALCUTTA

BYRAM MISTRY
119, Parsee Bazar Street
Fort, BOMBAY, No. 1

THE BRITISH DRUG HOUSES Ltd.
LONDON

Vit/Pr./In./291.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"NORMACOL" BRAND.
TRADE MARK

Intestinal Evacuant.

"Sweeps the bowel clean"

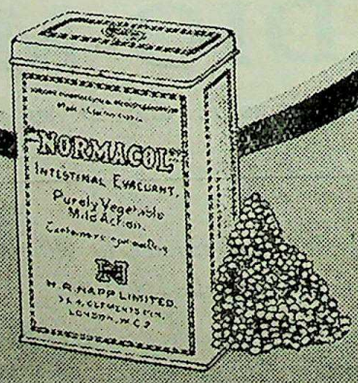
PAINLESS. HARMLESS.
MECHANICAL IN ACTION.
NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

A PURE VEGETABLE PRODUCT.
Containing NO Agar-Agar,
Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H. R. NAPP LIMITED,
3 & 4, Clements Inn, London, W.C.2.
Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two Lines).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

bacteriology even when this word is used, as it so commonly is, to include any kind of pathogenic organism. But more frequently they are taken under the wing of the protozoologist. We do not know of any university which has established a chair of chlamydozoology yet, but we feel sure that it will not be long before one of the more progressive American universities does so. The subject is one that up to the present has been left mostly to the research worker. It is not surprising, therefore, that the first comprehensive book on the subject should come from the Rockefeller Institute. The book is edited by Dr. T. M. Rivers who also contributes the introductory chapter. There are nine other contributors each of whom is responsible for one chapter; the contributors are for the most part colleagues of Dr. Rivers at the Rockefeller Institute.

Our present knowledge on the subject of filterable viruses is, to say the least of it, sketchy. The evidence for many of the theories that are put forward is very scanty and consequently these theories are not universally accepted. In most instances in this book the various views are given although the writer naturally emphasizes his own special view on the subject. One's first impression might be that the subject is a small one, but one soon realises that, on the contrary, it is so large that an important subject like rabies can only be alloted three pages. Poliomyelitis has on the other hand been dealt with very thoroughly, in one chapter of forty odd pages, as a type specimen of human filterable-virus disease. The victims of filterable-virus diseases are not only man but cattle, birds, insects, plants and even bacteria. In this book the whole range of viruses is dealt with, though the bacteriophage has not received much attention.

The book which contains a very fair statement of our present knowledge on the subject, is well written throughout. The illustrations are useful and there is one excellent coloured plate demonstrating the various specific cell inclusions. It will undoubtedly be accepted as the standard work on the subject and should find its way into every medical library. We would like to make one small suggestion for the next edition and that is that more attention should be paid to the numbering of the plates and figures; some confusion might conceivably arise through at least three plates in different chapters in the book being described as Plate I. Other plates bear no number at all.

L. E. N.

ELEMENTARY PATHOLOGICAL HISTOLOGY.—By W. G. Barnard. London: H. K. Lewis & Co., 1928. Pp. 80, with 176 illustrations on 52 plates. Price, 7s. 6d. net.

THIS is an example of spoon-feeding; but spoon-feeding at its very best. Most of us as students were given pieces of morbid tissue, or at the best were allowed to fish a ribbon of paraffin sections from a dish of water, we were shown the technique of mounting and staining, this we did very indifferently, for the first few classes at any rate, we were then shown a very diagrammatic drawing of what we ought to see, were expected to correlate the mess under our microscopes with that drawing and identify the various cells and groups of cells. We were not taught that there is anything "inherently indelicate in a curiosity which brings it to bear on a tumour or inflammation" but we were certainly not encouraged to use our oil immersion lens in the pathological histology classes; the sections or the cover slips, or both, were usually too thick for this.

This book consists of about 170 most excellent photographs of sections of the whole range of morbid tissues, commencing with inflammation and ending with tumours. Each photograph has a short but very complete explanation on the opposite page. Besides this there is very little reading matter, but at the beginning of each of the thirty sections, into which the subject is divided, there is a page of introduction. There are also a few very useful diagrams. It is a book which will save the student of pathological histology many days of groping about in the dark, and it should stimulate him to prepare sections equal to those from which these photographs have been taken, rather than provide him with an excuse for not preparing his own sections. To the post-graduate student who wishes to revise his knowledge of the subject, the book should prove invaluable.

The photographs are excellently reproduced on very good paper and the book is sold at a very moderate price.

It would obviously be out of place in work of this nature to give any details of technique, but we think that a few lines, say in the preface, giving the staining method that was used in preparing these slides would not have been out of place. We should also like to have seen the magnification, or the numbers of the lenses used, noted under each photograph; but the author probably had some good reason for not doing this. The spelling "injest" is new to us, but we feel sure that it must be justifiable as Dr. H. D. Wright concurs.

L. E. N.

AN INTRODUCTION TO EXPERIMENTAL PHARMACOLOGY.—By Torald Sollmann, M.D. and Paul J. Hanzlik. London and Philadelphia: W. B. Saunders Company, Ltd., 1928. Pp. 321, Illustrated. Price, 20s. net.

THIS is an adaptation from the senior author's "Laboratory guide in pharmacology." The book is divided into two chief divisions—chemical pharmacology and experimental pharmacology. The chemical portion deals with solid and liquid pharmaceutical preparations, with lessons in incompatibility, metrology, poisonous drugs, and their antidotes. The chapter on osmotic and colloidal phenomena gives a good summary of the principles of physical chemistry that a student of pharmacology ought to know. The chapter on agglutination, hæmolysis and hæmoglobin changes, briefly deals with all the important items of hæmatology. The nature of protoplasmic poisons, and the simple technique of testing the effect of drugs on unicellular organisms, worms, ferments, etc., are discussed in the last chapter in chemical pharmacology.

The section on experimental pharmacodynamics begins with the first two physiological properties of protoplasm —excitability and contractibility. The physical experiments like Bernstein's experiments, Rhumbler's model, etc., reveal a striking resemblance between physical and protoplasmic movements and will strongly impress upon the mind of the student the nature of infusorial, and amœboid movements. Four chapters are devoted to the study of smooth muscles and the series of nicely arranged experiments with appropriate discussions on them will help the student a great deal in appreciating the complicated physiology of the unstriped muscle.

The movements of the gastro-intestinal tract are fully discussed and the authors have tried to explain the peristaltic co-ordination by the gradient of irritability and by the refractory phase of the muscle itself and discredit the nervous "enteric system" of Langley regulating the pendular and peristaltic movements of the intestines.

In the section dealing with the heart, a brief discussion on general properties of cardiac muscle is followed by experiments demonstrating the technique of perfusion of the hearts of amphibians and mammals. A short note on the assay of cardiac tonics is also added. A review of the autonomic system dealing with the anatomy and principles of localisation of action is very useful for the student.

The methods of studying the bronchial muscles are brought up to date by including some new techniques devised by the author. The perfusion method described does away with the vascular factor—a great disadvantage in other methods. Allergic and glandular reactions are also discussed.

The central nervous system has two chapters devoted to its study, dealing with cerebro-spinal depressants and stimulants. The treatment of poisoning by convulsants is also included.

The last three chapters are devoted to respiratory reactions, and circulatory correlations and changes in urine flow, dealing mainly with the study of the respiratory and vasomotor centres and a discussion on the mechanism of diuresis with notes on perfusion of the kidneys.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Valuable appendices are added containing a description of the requirements of an experimental pharmacological laboratory, doses and methods of giving drugs to animals, and the preparation of physiological solutions. The list of reference books is very useful. A course of pharmacology and pharmacodynamics is also scheduled.

The book is essentially practical and meant for students of pharmacology. The discussions added to the data derived from the experiments are very well arranged and details of physiology are rightly referred to text-books on that subject. Although meant for students the book is indispensable to independent workers and teachers of pharmacology. The selection of experiments for students when dealing with a subject like pharmacology is difficult, and the vast experience of the authors as teachers has greatly helped them in making a selection. No student or teacher of pharmacology can be without this most valuable contribution to that science.

R. N. C.

RADIATION IN CHEMISTRY.—By R. Alan Morton, B.Sc., Ph.D. (Liv.), F.I.C. London: Baillière, Tindall and Cox, 1928. Pp. xvi plus 284, with 44 figures. Price, 15s. net.

THIS small volume of 284 pages covers rather a wide range of inter-related subjects and as such it has not been possible to go into the details of every aspect of "Radiation in Chemistry." The presentation of the theory of radiations is meagre with only a brief statement of the fundamental laws of radiations and photochemistry. Barring these limitations, the book has been written very lucidly and with a clear exposition of the subjects in view, and it contains useful practical information.

Section I begins with a brief statement of the two rival theories on the nature of radiations—the electro-magnetic theory of Farraday and Maxwell, and the quantum theory of Planck, and ends with a short account of the mechanism of photochemical reactions. In sections II and III, we have an accurate account of different types of sources of light and of the various methods of measuring the intensity of radiations. In sections IV and V a few types of photochemical reactions and their applications in photography and allied sciences have been recorded in great detail. The most interesting section, however, from the point of view of medical men is section VII, which deals with biochemistry and light. In these days of actino-therapy the author has done well to avoid the tendency, which has recently become apparent, to exaggerate the curative value of light. On pages 194, 195, we read "the exposure of the human body to sunlight causes an increase in the blood alkalinity," and that this change usually occurs concomitantly with pigmentation of the skin, but the mechanism by which this is brought about is not clear. Later on the author discusses the question of the synthesis of vitamins in the animal organism by subjecting it to different types of irradiations. The book is concluded with a short review of the applications of x-rays in chemistry and medicine. On the whole, the book will be very useful to those chemists and medical men who wish to get a general idea of the nature of radiations and their practical applications.

R. N. C.

APHRODISIAC REMEDIES.—By The Staff of the "Practical Medicine." Published by the Practical Medicine, Delhi, 1928. Cloth, Pp. 215. Price, Rs. 4.

THIS volume is said to be compiled from standard works and articles of eminent physicians and surgeons contributed to the medical journals and books. The book has already run through three editions so evidently there is a demand for it. In the present edition the subject matter has been re-arranged and all new remedies used against sexual debility have been included. The book is divided into four parts. The first part deals with aphrodisiacs used internally; the second part deals with those used externally; the third part gives special methods of treatment recommended by eminent authorities. The last section dealing with the methods of treatment employed by the indigenous practitioners in India is interesting; there is also a list of Indian aphrodisiac drugs. The book will certainly be of use to practitioners interested in aphrodisiacs.

R. N. C.

THE ENDOCRINES IN GENERAL MEDICINE.—By W. Langdon Brown, M.A., M.D., F.R.C.P. London: Constable and Co., Ltd., 1927. Pp. 144. Price, 7s. 6d. net.

THE author has attempted in this small volume to give a brief account of the endocrine system and its diseases for the benefit of the general practitioner. Few subjects in recent years have so powerfully stimulated interest and imagination as endocrinology and in view of the difficult nature of the subject and the vast amount of literature which has been produced, this book is very welcome. It puts before the practitioner all the knowledge necessary to him for diagnosing and treating cases with disturbed endocrine mechanism. The affections of different endocrine glands are dealt with separately and the author gives many examples from his personal experience by way of illustration. The book is written in simple and lucid style and makes this difficult subject easily comprehensible. We have no hesitation in saying that the book should form part of the library of every practitioner.

R. N. C.

THE EXTRA PHARMACOPŒIA OF MARTINDALE AND WESTCOTT.—Revised by W. Harrison Martindale, Ph.D., F.C.S. Vol. I. Nineteenth Edition. London: H. K. Lewis & Co., Ltd., 1928. Pp. xxxvi plus 1,207. Price, 27s. 6d.

THE first edition of this valuable book came out nearly forty-five years ago and since then it has gone through nineteen editions. That in itself is sufficient evidence of the popularity and utility of this book. It has been the constant endeavour of the authors to include in new editions all the new drugs and preparations that have been accepted by the profession and this edition contains nearly a hundred more names than the last edition. A very good summary of the claims made regarding new remedies has been given, ending up with a very fair criticism of these claims. All the recent advances made in therapeutics have been touched including the application of liver therapy in anæmia and the production of vitamin D by irradiation of ergosterol.

This edition like the previous ones is an unrivalled book of reference and the profession owes a very great debt of gratitude to the author for the great labour and the trouble he has taken in presenting this accurate and comprehensive summary of the therapeutic agents in use. This is a book which no medical practitioner can afford to be without.

R. N. C.

GESUNDHEITS-RATGEBER FUR WAERMERE ZONEN.—By Hans Ziemann. Sixth Edition. Berlin, 1928. Pp. 90.

THIS popular booklet is written for laymen living in lonely outposts of civilisation, sometimes far away from medical help. The first three chapters are especially valuable, dealing with general hygiene in the tropics, like housing, food, clothing, water-supply, physical exercises, servants, etc. The following chapters explain the most important tropical diseases, giving the symptoms which may be recognised by laymen. Malaria, yellow-fever, bowel-complaints including the dysenteries, and sleeping-sickness are especially considered. Only that part of treatment and nursing is dealt with which can be carried out without a physician. Special stress is laid upon these symptoms which urgently need trained medical help and the author warns laymen against attempting any line of treatment which can only be carried out by skilled medical men. Of very great value are the very extensive prophylactic hints, which are added to each chapter.

A special advantage is the very short but clear style, which omits all superfluous scientific details. The booklet shows on every page the great personal experience

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"THE MEDICAL OFFICER"

"The Selective Action of Antiseptics"

The proprietors of a certain antiseptic have for some time past been making misleading statements in their advertisements in the medical journals as to the value of the Rideal-Walker test.

They state that—"The test organism employed in this method is B. typhosus, and an antiseptic which will kill this organism in high dilution will not necessarily kill others under similar conditions."

It is desirable that the Medical Profession should not be misled on this important matter, and subjoined is a schedule showing the various organisms employed with this test by distinguished investigators as far back as the year 1909, when working with a certain well-known product.

Investigator	*Organism*	*Rideal-Walker Co-efficient*
Prof. Sir William Simpson	B. pestis	34.0
Dr. David Somerville	V. cholerae	32.3
Prof. Sir William Smith	B. diphtheriae	20.0
Col. Sir R. H. Firth, K.B.E., A.M.S.	B. typhosus	11.0
Dr. Samuel Rideal	B. dysenteriae	10.0
Prof. Klein, F.R.S.	Staph.p.aureus	9.3

Copies of the approved technique of the Rideal-Walker test may be obtained on application to :—

THE AINSLIE WALKER LABORATORIES
40, LUDGATE HILL, LONDON, E.C.4

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BRITISH
MANUFACTURE

TRADE MARK **GARDENAL** BRAND

PHENOBARBITAL

Phenylethylmalonylurea

The most efficient treatment in

EPILEPSY

Invaluable as a sedative in

CHOREA
MIGRAINE
ECLAMPSIA
ASTHMATIC CONDITIONS
NEURASTHENIA
PERTUSSIS
INFANTILE CONVULSIONS

Indian Agents:—

MAY & BAKER (INDIA), LTD.,
Head Office: 3, Mangoe Lane, CALCUTTA.
Telephone 5339.
Telegraphic Address: Bismuth.
Warehouses: 21, Tangra Road, Entally.
Telephone 887.
16, Ballard Estate, BOMBAY.
3/4 San Thome, Mylapore, MADRAS.
P. O. Box 1071 RANGOON.

OR FROM THE MANUFACTURERS

MAY & BAKER, LTD., BATTERSEA, LONDON, S.W. 11

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of the author. There exist an English and an Italian translation.

O. U.

FAVOURITE PRESCRIPTIONS.—By Espine Ward, M.D. (Belfast). Second Edition. London: J. & A. Churchill, 1928. Pp. 101. Price, 5s. net.

THIS little book is divisible into three sections. The first 13 pages are devoted to a list of pharmacopœial drugs and their preparations: there follows a brief section entitled "Hints for Treatment of Poisoning," while the remainder of the book contains lists of the different prescriptions that have been found useful by the author. Prescriptions coming within the scope of the Dangerous Drugs Act of Great Britain are usefully indicated by the letters D. D. A. in brackets.

The volume should prove of value for ready reference purposes. Printing on one side of the paper only allows of still further prescriptions being added. There are a few errors which will doubtless be expunged from future editions. The printing is good, the book is of handy size and the price is eminently reasonable.

J. M. H.

THE ESSENTIALS OF MEDICAL DIAGNOSIS.—By Sir Thomas Horder, Bart, K.C.V.O., M.D., F.R.C.P. (Lond.) and A. E. Gow, M.D., F.R.C.P. (Lond.). London: Cassell and Co., Ltd., 1928. Pp. 682, with 8 colour and 11 black and white plates and 22 figures in the text. Price, 16s. net.

THE importance of correct diagnosis in any system of treatment cannot be over-estimated. "Diagnosis is half cure" is a well-known adage. To the student and practitioner probing the mysteries of the human structure and its ills, the need of full and accurate data to enable him to diagnose the malady is the first desideratum. It is to guide the student in this direction that the present volume is designed.

The names of the distinguished authors are indeed a sufficient guarantee of the usefulness and value of the book itself. They have brought their wide knowledge and long experience within reach of the novice entering upon the arduous duties of a medical practitioner. To the student who arrives at the wards after going through a curriculum of medical studies, the present volume is indeed a mine of information. It will help him more easily to deal with the clinical aspects of a case and understand more clearly the various factors, such as contours, complexion, attitude and movement which go to make up the study of the human body as a living anatomical and physiological unit. It is especially with this view that the authors have dealt with diagnosis under various physiological heads and in a most elementary fashion. The volume gives concise descriptions of the methods of investigation of cases in practice and tells the reader how to interpret the results of enquiry. Though pathological tests and data receive due attention, greater emphasis is rightly laid on the clinical side of the investigation. The book is intended primarily for the student, but it will appeal equally to the practitioner. The text is copiously illustrated.

S. P. B.

CLINICAL MEDICINE.—By Oscar W. Bethea, M.D., Ph.G., F.C.S., F.A.C.P. Philadelphia and London: W. B. Saunders Co., 1928. Pp. 700. Price, 35s. net.

THIS is an admirable book of handy size in which the author has incorporated the latest and most generally accepted information as to the diagnosis and treatment of about one hundred common diseases coming within the province of Internal Medicine. Unproven theories as to the causation of diseases have been entirely omitted and thus the bulk of the book reduced.

In well-equipped hospitals and in wealthy houses the doctors in-charge get all the facilities of modern science but the vast majority of cases are amongst the poor and cannot even get treatment in the hospitals. Doctors are greatly handicapped in their management of such cases. The author has taken therefore particular interest in the management of cases wherein the facilities of modern technique are limited. The book will prove of immense value if properly used and the author is to be congratulated on bringing out a volume containing such useful information.

S. P. B.

DIABETIC MANUAL FOR PATIENTS.—By Henry J. John, M.A., M.D., F.A.C.P., M.R.C. St. Louis: The C. V. Mosby Company, 1928. Pp. 202, with 42 illustrations. Price, $2.00.

DIABETES is one of those diseases, the keynote of success in the treatment of which depends largely on the good sense and intelligent co-operation of the patient. It is essential, therefore, that the diabetic patient should, at any rate, be familiar with the *rationale* and the main principles underlying the treatment of the disease, particularly dietetic and hygienic, so that he will be able to co-operate with his doctor intelligently and wholeheartedly.

Dr. John in this little volume has taken great care to explain very fully the principles underlying the causation, pathology and treatment of diabetes. As a matter of fact, it seems to us that he has gone rather too far when he describes the details of the anatomical and physiological study of the disease. To an average diabetic patient, some of these details would be rather difficult to understand.

The practical details which the author has taken so much pains to give regarding the treatment by diet and by insulin are very useful and will be of much help to all careful readers of the book. The book is profusely illustrated which is a great advantage to the lay reader enabling him to understand the subject matter easily.

Appendix II dealing with sample *menus* and various food-recipes for the diabetic has been prepared by Miss Laura Soden, Dietitian in the Diabetic Department of the Cleveland Clinic Hospital and is an excellent supplement to the book. It gives quite a variety of diet-prescriptions which, we are sure, will appeal to all diabetic patients.

The book will be very helpful to all persons suffering from diabetes, as its study is expected to make the diabetic patient follow his doctor's instructions more intelligently, and thus the end-results will prove satisfactory.

J. P. B.

CARE OF INFANTS IN INDIA: A WORK FOR MOTHERS AND NURSES IN INDIA. London: Messrs. Caldwell, Ltd. Pp. viii plus 92.

THIS little book though primarily an advertisement for the well-known Mellin's Food contains so much useful information about the care of babies in India in a compact form that it could safely be put into the hands of any young European mother who required simple advice for both herself and her child. There are certain minor points with which one could disagree, such as the desirability of giving a healthy infant 2-hourly feeds for the first month of life, and introducing meat into his diet before he is a year old, but on the whole the information given is in agreement with modern medical knowledge and if the directions were carefully carried out, the Anglo-Indian infant mortality in this country would be considerably reduced. Small books in the vernacular on the same subject but with modifications on the diet questions are greatly needed by Indian mothers.

G. S.

INTERNATIONAL CLINICS. (A QUARTERLY JOURNAL).—Edited by Henry W. Cattell, A.M., M.D. Philadelphia and London: J. B. Lippincott Company, 1928. Volume I. Thirty-eighth Series. Pp. x plus 307, with numerous illustrations and plates. Annual Subscription, Rs. 37-8. Available at Messrs. Butterworth and Co. (India), Ltd., Calcutta.

THIS is a quarterly of illustrated clinical lectures and specially prepared original articles, on Treatment, Medicine, Surgery, Neurology, Pædiatrics, Obstetrics,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Gynæcology, Orthopædics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene and other topics of interest to students and practitioners by leading members of the medical profession throughout the world, edited by Henry W. Cattell, A.M., M.D., Philadelphia, U. S. A., with the collaboration of many well-known authors.

This volume contains about one hundred illustrations including some important ones relating to medical history of the period of the Renaissance. This will prove of immense value to advanced and post-graduate students as well as to practitioners, as they may get information on various important topics contained in the series of volumes compiled by the leading members of the profession of the world.

S. P. B.

RECENT ADVANCES IN CHEMISTRY IN RELATION TO MEDICAL PRACTICE.—By W. McKim Marriot, B.S., M.D. St. Louis: The C. V. Mosby Company, 1928. Pp. 141. Illustrated. Price, $2.50 net.

THIS is a well got-up volume consisting of 138 pages divided into a series of six lectures. These lectures have been given primarily for the purpose of acquainting medical practitioners with the recent advances in chemistry that are applicable to medical practice. On taking up the book we rather expected to find a volume devoted to chemical formulæ and technicalities but in this we were agreeably surprised and found instead a very practical exposition of the modern applications of the recent chemical advances that bear on the practice of medicine. The book as noted before, is divided up into a series of lectures commencing with one on fundamental considerations. This lecture on the whole is slightly disappointing though it must be admitted that it is an almost impossible subject to compress into one lecture, and at the same time hope to give a lucid account of atoms, molecules, ions, mass law, etc. Lecture No. 2 deals with acidosis and alkalosis and here the real value of the book is revealed as the subject is dealt with in an able and very practical manner. Lecture No. 3 is on the chemistry of the blood which is also dealt with simply and practically. Lectures No. 4 and 5 are concerned with food and metabolism beginning with the fundamental principles of diet and gradually leading on to the application of those principles to dietaries suitable in diseased conditions, propositions that the general practitioner must consider very carefully in his everyday work. Lecture No. 6, gives an account of the endocrines and the subject is dealt with in an eminently sensible manner.

The book can be thoroughly recommended to the general practitioner and even the specialist will find much to cogitate on. It also serves a very important function in bringing the fundamental facts of chemistry to the ken of the busy practitioner and of these facts he is often ignorant, though they are of the utmost importance in the practice of medicine.

T. C. B.

TROPICAL GYNÆCOLOGY. (CLINICAL LECTURES).—By Colonel V. B. Green-Armytage, M.D., F.R.C.P., I.M.S. Calcutta and Simla: Thacker, Spink and Co., 1928. Pp. xv plus 842, with 3 plates and over 100 photographic and other illustrations. Price, Rs. 20.

THIS little book, a companion volume to "Tropical Midwifery" by the same author, is in the form of eleven lectures on a variety of gynæcological subjects. Most of these have already appeared in print at various times.

In the words of the writer—a collection of "some of my own experiences and findings over a period of 18 years" it is not intended as a text-book of gynæcology or even of tropical gynæcology, and, as is inevitable in a book of this kind, it becomes in places a veritable hotch-potch of information, but it nevertheless contains much interesting material and many practical hints of value both in private practice and in gynæcological surgery.

To quote the text again "It is important that all teachers and professors of gynæcology and obstetrics in India should keep up to date" and many of Col. Green-Armytage's lectures although beyond the scope of the general practitioner, indicate the fields in which modern advances have been made, Vide *Lecture XI* on the low Cæsarian section of De Lee much advocated by the writer—the use of glucose and insulin in shock, *Lecture IV* on Sterility and the use of Rubin's insufflation test and Hobb's glycerine injection. *Lecture VII* on Prolapse is also particularly good and useful in a country where this condition is so common. *Lecture VI* on pelvic inflammation and *Lecture VIII* on vaginal hysterectomy may also be mentioned as containing much modern and useful information. *Lectures II, III, IX, X*, are in the form of notes on various subjects—*Lecture II*, on disorders of pregnancy, on prolapse, fistula and cancer —*Lecture III*, on disorders of menstruation—*Lecture IX*, on sterility, chronic metritis, prolapse, retroversion, and endocrinology—*Lecture X*, on hæmorrhagic ovarian cysts, fibroids, prolapse, varicocele of the broad ligament, pyelitis and menstrual disorders. Much of the material in these lectures is duplicated in other parts of the book but there are some useful hints and prescriptions.

In conclusion some mention must be made of the "hors d'œuvre" of the book, *Lecture I*, on obstetrics and gynæcology in the days of the Patriarchs—a very interesting chapter but one which should not be attacked without a Bible at hand for reference.

"Tropical Gynæcology," useful in size and material, will prove a useful addition to library and consulting room.

M. F.

Annual Reports.

ANNUAL REPORT ON THE WORKING OF THE G. I. P. RAILWAY, MEDICAL DEPARTMENT, FOR THE YEAR 1927-1928. BY R. J. L. SLADEN, F.R.C.S. (ENG.), D.P.H., OFFICIATING PRINCIPAL MEDICAL AND HEALTH OFFICER, G. I. P. RAILWAY, BOMBAY.

THE figures contained in this report are based on an average subordinate staff population of 11,36,697. The total sick days' leave granted amounted to 5,92,508 while the average days lost per man per year (all classes) worked out at 8.84. The total cost of sickness for the year for all classes was Rs. 17,95,737. Analysing the figures still further it is found that 1,09,534 members of the staff were treated as out-patients and 2,139 as in-patients during the year.

Total deaths in out-door and in-door patients numbered 236 equivalent to 207.6 per 1,00,000 men employed. In addition to these figures, 48,184 members of the families of employees were treated as out-patients and 438 as in-patients. The total of deaths in this group was 113.

The G. I. P. Railway maintains no fewer than 8 District Hospitals containing 174 beds, in addition to 32 beds at various dispensaries. The number of beds works out at 1.81 per 1,000 of the staff and the average number of beds occupied in the District Hospitals per diem was 87.82.

A total of 2,770 operations (699 major and 2,071 minor) was performed at the District Hospitals during the year under review, an increase of 587 over the previous year. Periodical re-examinations of employees as regards visual acuity, colour perception, and hearing totalled 10,920 during the year ending 31st March, 1928, while corresponding examinations of recruits on appointment numbered 20,463 during the same period. In this connection Dr. Sladen remarks that:—"The class of the men applying for work in the shops do not appear to be drawn from very healthy stock. Out of 8,568 recruits, 1,397 failed to obtain the required standard, making a percentage failure of 16.30. The large number of failures was on account of defective vision.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

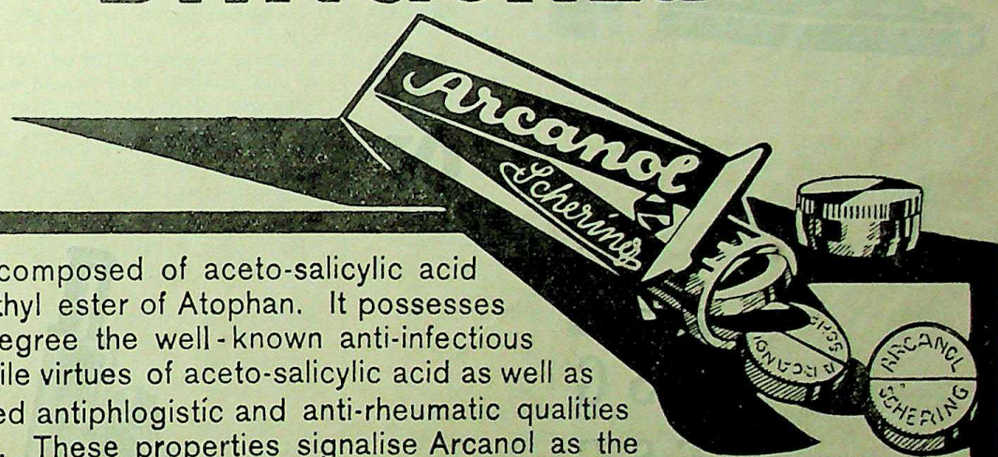
Digitized by Arya Samaj Foundation Chennai and eGangotri

Arcanol

Schering

AGAINST

Influenza



Arcanol is composed of aceto-salicylic acid and the methyl ester of Atophan. It possesses in a high degree the well-known anti-infectious and antifebrile virtues of aceto-salicylic acid as well as the far-famed antiphlogistic and anti-rheumatic qualities of Atophan. These properties signalise Arcanol as the remedy par excellence against influenza and its complications, angina, catarrhal affections of the upper respiratory tracts, scarlatina, etc. It will be found most convenient to administer Arcanol in daily doses of from 3 to 4 tablets after meals. Original packing: Tubes containing 10 tablets of 15 grains. Samples and literature will be gladly sent to medical men on application to:

SCHERING-KAHLBAUM (INDIA), LTD. CALCUTTA

Telephone: Cal. 4770
Telegrams Aeskulap

4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

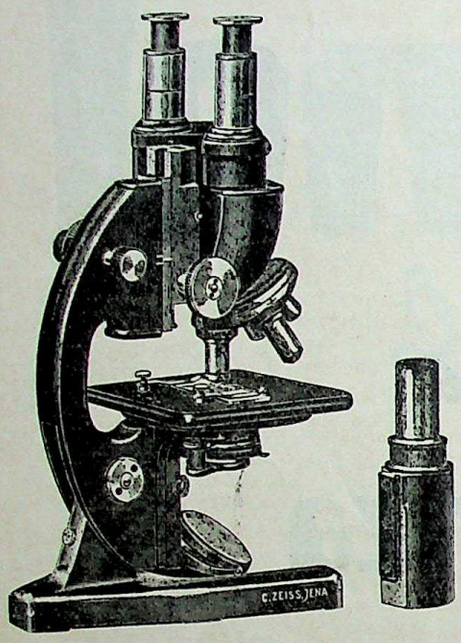
F. SCHWERZMANN & CO., Rangoon (Burmah): 26, Merchant Street.

2044501

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Two supreme types of Zeiss Stands

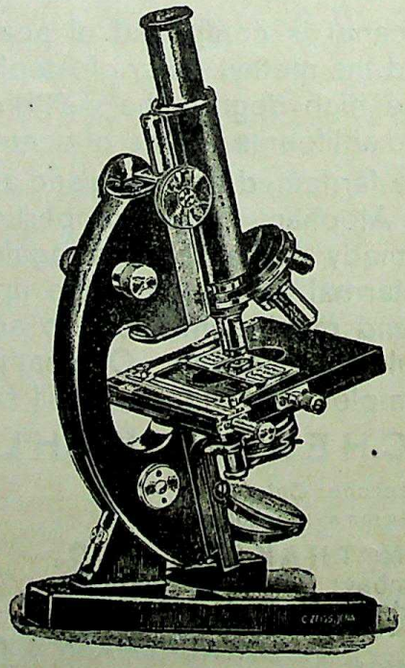


DSG
DSC
DSA

With Mono-Binocular Tubes

&

ESG
ESC
ESA



That Combine Perfection of Mechanical Strength, Form and Ease of Manipulation.

Sole Distributors for India:

ADAIR, DUTT & Co., Ltd.,
5, Dalhousie Square, E.

Branches—**BOMBAY:**
Ballard Estate.

MADRAS:
Kaleeli Mansions,
Mount Road.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Speaking generally this class of workmen live outside railway lands where the advantages of sanitation, well constructed and ventilated buildings obtained by the running staff are not available.

A feature which is coming to light in connection with re-examination of staff is the material benefit to workmen by prescribing suitable glasses for their work.

Defects in visual acuity are often not appreciated by the workers. They come on gradually and would be the reason for much inefficient work, and often would not be remedied in the absence of periodical re-examinations.

During the year ending 31st March, 1928, 239 prescriptions for spectacles have been issued from this office and far many more have been given by District Surgeons....."

Statistical Notes on certain special diseases.

(*a*) *Malaria.*—The prevalence of malaria for the system taken as a whole rises in May, with extreme uniformity to a maximum in October, falling thereafter gradually till March with a very insignificant rise in February.

Anti-malarial measures were maintained throughout the year at their former level. The Principal Medical and Health Officer attended joint conferences with various local bodies in the Island of Bombay including the Corporation, the military authorities, and the department is now co-operating with the Officer-in-charge Malarial Survey appointed by Government, for devising and co-ordinating anti-malarial measures in the city of Bombay.

Anti-malarial operations were carried out throughout the year such as filling of low-lying lands, improving drainage, destruction and prevention of breeding of mosquitoes, etc.

Attention has been drawn to the importance of accurate diagnosis and better records of cases of malaria and it is hoped that much useful information will be available in the course of the year. Efforts are being made to estimate more accurately the morbidity-rate from malaria and the number of working days lost through this disease, per employee per year, for the various grades and departments.

(*b*) *Influenza.*—Among staff, influenza of a generally mild type was moderately widely distributed; 7 sections furnished no returns.

For the line taken as a whole the maximum incidence was in March (247 cases); the minimum in December (123 cases); the total recorded cases 2,050, the average monthly return 170.83. Epidemic characteristics were wanting.

Amongst the families of staff the returns total 558 for the year, the maximum incidence was in March (67 cases), the minimum in February (22 cases), the average per month 46.5. Ten sections recorded no cases.

Examination of the individual sectional returns which in general run parallel with those for staff suggests that the bulk of all cases, presumably on account of the prevalently mild type of infection, escaped registration and that accordingly detailed analysis of the distribution is impossible.

(*c*) *Cholera.*—The total number of cases of cholera which occurred on the line was 114, of these 49 were among the staff and 65 in the families.

(*d*) *Small-pox.*—The period of maximal incidence was in May and of minimal incidence in September—November. The total number of cases returned as treated was for staff 156, for families of staff 271. The total number of deaths returned as due to small-pox was 19, equivalent to 4.4 per cent. of the reported cases amongst employees and members of families.

(*e*) *Plague.*—The staff and their families suffered lightly from plague during the year, Jubbulpore alone returning double figures—the total reported cases amounted in all to 65 with 14 deaths. 21 cases occurred amongst employees and 44 amongst their families.

(*f*) *Venereal Disease.*—The total return of venereal Diseases treated among employees was 799 or, to very near approximation, 0.7 per cent. of the average staff employed.

For various reasons the returns cannot be regarded as adequately representative of the prevalence of venereal disease in the community.

Returns of Accidents.

The accidents reported, as occurring to staff and public in the year aggregated to 1,891, of which 1,354 occurred among staff, 241 among passengers and 296 to outsiders, such as trespassers, etc. 220 resulted in the death of the injured. The incidence of accidents amongst staff was accordingly 1.19 per cent. and that of the fatal accidents about 0.036 per cent.

In the year under review there have been 197 more cases reported than in the previous year, but the number of deaths has been 41 less.

In addition to these cases, 20,660 cases of injuries (general and local) have been treated as reported in the monthly hospital and dispensary returns, being an excess of 1,032 over the previous year. Some of these injuries are indirectly connected with duty.

Greater attention is now being paid to minimising the number of days lost by an employee through injuries—one of the chief duties of the medical departments of railways being the efficient treatment of injuries.

The important factors in lessening injuries and their effects may be stated as—

(1) Safety First movement.
(2) Rendering of prompt and efficient First Aid.
(3) Prompt and skilful professional treatment.

Vaccination and other prophylactic inoculations.

(*a*) Anti-rabic treatment. The prophylactic treatment of staff and the families of staff bitten by rabid animals continued to be carried out at two centres on the railway—at Byculla where treatment was available throughout the year, 319 cases were treated with no deaths: at Jhansi where patients were received for treatment from November to February, 8 cases were treated with no deaths.

(*b*) Vaccination returns showed a total of 1,576 performed, *viz.*:—

	1927-28.	1926-27.
(*a*) Primary	1,013	1,002
(*b*) Secondary	563	794
(*c*) Anti-plague	1,026	1,571
(*d*) Anti-cholera	526	..
(*e*) Anti-enteric	18	19

Clinical Pathological Laboratory Returns, etc.

The total number of examinations of all sorts conducted in the Clinical Laboratories attached to District Hospitals at Igatpuri, Bhusaval, Jhansi, Ajni, Jubbulpore and Sholapur, amounted to 6,249 during the year. The development of work was satisfactory though capable of much further profitable extension in the future. The laboratories attached to Igatpuri, Bhusaval, Jhansi, Jubbulpore and Sholapur Hospitals, furnish returns of interest and of value. Good work was done in the investigation of clinical malaria. The total expenditure during the year on outside assistance to the laboratory diagnosis of sickness amongst staff was extremely small like last year.

Training in First Aid.

The statement of the year's gross results show that 74 classes were held and that 744 employees attended for instruction, of whom 490 passed in First Aid, 11 for the Voucher, 6 for the Medallion and 1 for the Label. The total number successfully trained up to the end of the period under review was 2,076 equivalent to about 1.83 per cent. of the average total staff.

ANNUAL REPORT OF THE EXECUTIVE HEALTH OFFICER OF THE CITY OF BOMBAY FOR 1927. BOMBAY: THE TIMES PRESS. 1928.

THE salient features of the above report may be summarised as follows:—

The number of live-births registered during the year was 21,685, being 617 more than in 1926, 775 more than

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the annual average in the quinquennium (1922-1926) and 933 more than that for the last decennium (1917-1926).

The deaths registered during the year numbered 27,633. The death-rate or number of deaths in the year per 1,000 of the estimated population was 21 and was lower than the rate for any year, since death-rates were first calculated in 1872.

Deaths from Plague numbered 207 during the year, as against 56 in 1926 and 520 the average of the preceding quinquennium (1922-1926).

Small-pox caused 842 deaths as against 480 in 1926 and 560 the average in the last decennium (1917-1926). Small-pox was epidemic for 15 weeks from 27th February, 1927.

Cholera was registered as the cause of 82 deaths, as against 5 in 1926 and 1,062 the average of the ten years 1917-1926.

Influenza caused 79 deaths as against 90 in 1926 and 999 the mean of the last ten years (1917-1926).

The deaths from diseases of the Respiratory System numbered 9,949 as against 11,901 in 1926 and 16,567 the average for the preceding decennium.

Tuberculosis accounted for 1,748 deaths as against 1,844 the mean of the ten years 1917-1926.

The number of deaths from Malaria was 365 and from Ague and Remittent Fever 1,633 as against 635 and 2,004 deaths respectively in 1926. The average number of deaths for the last five years 1922-1926 from Malaria was 518 and from Ague and Remittent Fever 2,483.

The deaths among infants under one year of age numbered 6,857 as against 8,200 in 1926 and 10,032 the average for the preceding decennium (1917-1926). The rate of infant deaths per 1,000 registered was 316, being the lowest on record since rates were first cast in 1874 for infants under the age of 12 months.

Compared with the decennial averages (1917-1926), the total number of deaths shows a decrease of 16,150, the principal decreases in the mortality being 527 under Plague, 128 under Measles, 980 under Cholera, 920 under Influenza, 52 under Malaria, 1,484 under Ague and Remittent Fever, 96 under Tuberculosis, 2,051 under Diarrhœa, Enteritis and Dysentery and 6,618 under diseases of the Respiratory System.

It is particularly noteworthy that the general death-rate and the mortality among infants under one year were the lowest on record.

Excluding 1,780 still-born children, the number of births registered during the year was 21,685 and was more by 617 than in 1926 and by 933 than the annual mean number of births registered in the ten years, 1917-1926.

The birth-rate calculated on the estimated population for 1927 was equivalent to 16.7 births per 1,000. Calculated on the Census population for 1921, the birth-rate was 18.4.

Of the children whose births were registered, 10,998 were males and 10,687 females, the proportion of males to females being 1,029 to 1,000.

The low birth-rate recorded year by year for the city is probably by no means a fair measure of the true fertility of the population. It is in part due to the custom whereby married women leave the city for their confinements and register their children in the mofussil districts where they are born.

The number of infants certified as still-born was 1,780 as against 1,676 in 1926 and the decennial average 1,900. Still-births are exluded in this report from all figures relating to deaths and to births not expressly defined as still-births.

The total number of deaths registered from all causes during the year was 27,633 being 4,358 less than in 1926. It was 7,965 less than the average annual mortality of 1922-1926 and 16,150 less than the average annual mortality of the preceding 10 years (1917-1926). The death-rate per 1,000 persons living was 21 and was lower than that for any year since 1872. The death-rate (like the birth-rate) is invariably high amongst the poorer classes; and as an unduly large proportion of the population of the city belongs to the most poorly paid sections of society, the general death-rate is raised by that of the unusually large proportion of the very poor. The Census of 1921 showed that 66 per cent. of the population live in one-room tenements.

Of the total number of 27,633 deaths in the year, 15,238 were among males and 12,395 among females. The larger number of deaths among males is due to the preponderance of males who form nearly two-thirds of the population, the actual death-rate being higher among females. Thus the male death-rate was 18 and the female death-rate 27 as against 21 and 33 respectively in 1926.

Diseases of the Respiratory System caused, as usual, a higher death-rate than any other group. Congenital Debility and Diseases of Early Infancy constituted the next most fatal group giving a death-rate of 2 per 1,000 persons living. The group coming next on the list for the year under report with a death-rate of 1.4 comprises the deaths attributed to Malaria, Ague and Remittent Fever.

Two rises in the mortality occurred, one in March due in part to deaths from Plague and Small-pox, and one in August in the rains due largely to deaths from Malaria, Ague and Remittent Fever.

The number of deaths among infants under one year of age was 6,857 being 1,343 less than in 1926, and 3,715 less than the annual average in the ten years, 1917-1926.

The infant mortality rate expressed as the number of deaths in infants per 1,000 registered births was 316 as compared with a rate of 389 in 1926 and of 483, the annual average in the decennium (1917-1926).

Of the total deaths 4,631 occurred among infants born in Bombay, and 2,226 in infants born elsewhere.

5,224 or nearly 76 per cent. of the total deaths in infants were due to diseases of the Respiratory System, Infantile Debility and Premature Birth against 77 per cent. (6,347 deaths) in 1926. Diarrhœa and Enteritis caused 333 deaths, Malaria, Ague and Remittent Fevers 115 deaths and Convulsions 688 deaths. The deaths from Small-pox and Measles numbered 151 and 32 respectively.

The high rates recorded suggest the presence in Bombay of some adverse factor in addition to the poverty and ignorance which are chiefly responsible for high rates in western countries. The added factor affecting all classes is probably malaria; another factor which can hardly fail to enhance the infant mortality among the more ignorant portions of the population is the practice of soothing babies by the administration of opium.

Syphilis, as recently emphasized by the delegates of the British Social Hygiene Council, contributes to the death-roll but whether to a greater extent than in other cities it is not possible to say when an overwhelming majority of the total deaths under one year are not certified by medical practitioners.

The work which is being done in Bombay for the reduction of infant mortality may be described under the following heads:—

(*i*) Visits by the Municipal District Nurses for the purpose of getting into touch with prospective mothers and for discovering cases of sickness especially among women and children and unvaccinated children; for inquiry into the condition of new-born infants; and for giving instruction by homely talks as to the care and rearing of children.

(*ii*) Attendance on confinements.

(*iii*) Provision of necessaries and comforts during the lying-in period.

(*iv*) Maternity Homes.

(*v*) Infant Milk Depôts.

(*vi*) Infant Welfare Centres.

Notification of Infectious Diseases.—The total number of cases of infectious disease registered during the year was 3,941. Under section 421 of the Municipal Act, 608 were notified by medical practitioners, as against 388 in 1926. Three cases were notified by Hakims and Vaidyas, who are not required by law to notify. 3,330 cases or 85 per cent. of the total number were found and reported by the District Registrars.

Plague.—Plague did not assume epidemic proportions at any time during the year. The number of Plague attacks was 223 against 63 in 1926. The disease caused 207 deaths in the year against 56 in 1926 and 734, the average for 1917-1926. The mortality among reported

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In chronic complications of Gonorrhoea

IN the treatment of the chronic complications of gonorrhœa some very striking results have followed the intra-muscular injection of Contramine, an organic sulphur compound with a complex molecule which, according to a well-known authority, owes its remarkable clinical action to its power to give the patient the means to resist the attack of disease germs.

Contramine has the effect also of softening fibrous tissue to such an extent that three injections at weekly intervals will convert a non-dilatable stricture into a dilatable one. Similar injections of Contramine in other complications of gonorrhœa are followed by successful clinical results, but in some of these conditions it is necessary to follow Contramine injections with a course of treatment with Mixed Gonococcus Vaccine (D.S.I. brand).

Contramine is non-toxic and it induces no pain either during or following its injection.

Contramine is supplied in solution in ampoules of 1 c.c. and 2 c.c., and in the form of pessaries for the treatment of gonorrhœa in women.

CONTRAMINE

Descriptive literature with clinical reports and particulars of technique of administration will be sent on request to either of the B.D.H. representatives resident in India :—

Henry S. Clark,
8/10, Waterloo Street,
Calcutta.

Byram Mistry,
119, Parsee Bazaar Street,
Fort, Bombay, No. 1.

THE BRITISH DRUG HOUSES LIMITED
LONDON

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOOK YOUR ORDER NOW at the SPECIAL PRICE

FORTY-SEVENTH ISSUE
NOW IN PREPARATION.

THE

MEDICAL ANNUAL, 1929

A Year Book of Treatment and Practitioner's Index
A Review of the Year's Progress in Medicine and Surgery

Subscribers, Pre-Publication, Rs. 11-8.
On Publication, Rs. 15-0 net.
Fully Illustrated in Colour and Black and White.

SOME CONTRIBUTORS TO THE NEW VOLUME.

J. H. ANDERSON, C.M.G., C.B.E., M.D.
JOSEPH BLOMFIELD, O.B.E., B.A., M.D.
W. LANGDON BROWN, M.A., M.D., F.R.C.P.
IVOR J. DAVIES, M.D., F.R.C.P.
HENRY DEVINE, O.B.E., M.D., F.R.C.P.
ALBERT EIDINOW, M.B., B.S., M.R.C.S.
JOHN FRASER, M.C., M.D., F.R.C.S.
A. G. GIBSON, M.A., M.D., B.SC., F.R.C.P.
A. M. H. GRAY, C.B.E., M.D., F.R.C.P.
E. W. HEY GROVES, M.S., M.D., F.R.C.S.
GEOFFREY HADFIELD, M.D., M.R.C.P.
L. W. HARRISON, D.S.O., M.B., CH.B., F.R.C.P.E., BREV.-COL. R.A.M.C. (Rtd.)
CHAS. THURSTAN HOLLAND, CH.M., M.R.C.S., L.R.C.P., F.R.C.S., D.L.
ROBERT HUTCHISON, M.D., F.R.C.P.
GEOFFREY JEFFERSON, M.S., F.R.C.S.
A. E. J. LISTER, M.B., B.S., F.R.C.S., LT.-COL. I.M.S. (Rtd.)
J. P. LOCKHART-MUMMERY, M.A., M.B., B.CH., F.R.C.S.
HUGH MACLEAN, M.D., F.R.C.P.
REGINALD MILLER, M.D., F.R.C.P.
JOSEPH PRIESTLEY, B.A., M.D., D.P.H.
SIR JAMES PURVES-STEWART, K.C.M.G., C.B., M.D., F.R.C.P.
SIR LEONARD ROGERS, C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S., LT.-COL., I.M.S. (Rtd.)
J. D. ROLLESTON, M.A., M.D., M.R.C.P.
W. G. SAVAGE, M.D., B.SC., D.P.H.
A. RENDLE SHORT, M.D., B.SC., F.R.C.S.
EDMUND I. SPRIGGS, M.D., F.R.C.P.
SIR JOHN THOMSON-WALKER, O.B.E., M.B., F.R.C.S.
SIR W. I. DE COURCY WHEELER, M.D., F.R.C.S.I.
H. BECKWITH WHITEHOUSE, M.S., CH.M., F.R.C.S
A. DICKSON WRIGHT, M.S., M.B., F.R.C.S.
A. J. M. WRIGHT, M.B., F.R.C.S.
WILLIAM H. WYNN, M.D., M.SC., F.R.C.P.

Associate Editors : Medicine CAREY F. COOMBS, M.D., F.R.C.P. *Surgery* A. RENDLE SHORT, M.D., B.SC., F.R.C.S.

Extracts from Press Notices of recent Volumes.

British Medical Journal.—"The 'Medical Annual' is an old and tried friend and its reappearance is always welcome; the forty-sixth issue, with its array of able contributors and its wealth of practical information, fulfils our expectations."

Indian Medical Gazette.—"To the general practitioner in this country the 'Medical Annual' is a godsend. It enables him by the expenditure of a comparatively small sum to keep up to date in all branches of his profession. To the specialist also it is an extremely valuable publication."

THACKER, SPINK & CO., P. O. Box 54, **CALCUTTA.**

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

cases was 93 per cent. as against 89 in the previous year.

The death-rate from Plague during the year was 0 16.

Plague Measures.—The usual preventive and precautionary measures, namely, (*i*) Inoculation, (*ii*) Rat Destruction, (*iii*) Evacuation and (*iv*) Disinfection, were continued during the year.

(*i*) *Inoculation.*—During the year, 100 inoculations against Plague were performed at the Haffkine Institute and 1,208 by the Municipal Medical Inspectors.

(*ii*) *Rat Destruction.*—The total number of rats collected and destroyed during the year was 592,936 against 579,806 in 1926. Of the 592,936 rats collected and sent to the Parel Laboratory, 261,766 were examined and 1,421 were found infected, giving a ratio of 0.54 infected rats per 100 rats examined as compared with a ratio of 0.45 in 1926.

The percentage of infected rats rose from 0.28 in January to 1.38 in May and then declined gradually to 0.19 in November.

(*iii*) *Evacuation.*—For the reception of contacts from infected dwellings, semi-permanent Health Camps at Koli Lane (Colaba), Suklaji Street, Tardeo, Arthur Road, Chinchpoogli (at the junction of DeLisle Road and Arthur Road) and Mahim Station were maintained.

(*iv*) *Disinfection.*—For the destruction of fleas, all rooms in which cases of Plague either in rats or in man had occurred were disinfested with Pesterine. Infested bedding is disinfected by steam.

Small-pox.—Small-pox was prevalent in the city throughout the year and caused 842 deaths against 480 in 1926 and 560, the average for the preceding ten years (1917-1926). The number of attacks from Small-pox registered during the year was 1,407 (including 51 imported cases) against 805 attacks in 1926.

The death-rate from Small-pox during the year was 0.64 as against 0.37 in 1926 and 0.4, the average during the preceding decennium.

As usual, the death-rate from Small-pox attained its maximum between March and May and fell to a low figure in the subsequent months of the year.

One hundred and fifty-one deaths from Small-pox occurred in children under one year of age and 235 in children aged 1—5 years. Of the total deaths, 386 or 46 per cent. thus occurred in the first five years of life against 49 per cent in 1926.

Vaccination.—There are 20 Vaccination Stations in the city. Three stations are open in the morning on every Monday, Wednesday, Friday and Saturday and two on every morning during the rest of the week. The station at Princess Street is open every Sunday and Wednesday morning and when Small-pox is prevalent in the city, during the afternoon hours on working days.

The total number of primary vaccinations and of re-vaccinations performed during the year was 20,374 and 29,196 respectively as against 18,615 and 16,888 in 1926.

The proportion of primary vaccinations (13,900) in children under one year of age to the total number of births (21,665) registered during the year was 64 per cent.

Of the 151 infants under one year of age who died of Small-pox during the year, 126 were not vaccinated and 3 were vaccinated during the incubation period. In the remaining 22 cases, the vaccinal condition was not ascertained.

Cholera.—There were 151 attacks and 82 deaths from Cholera during the year as against 5 attacks and 5 deaths in 1926.

The outbreak began in the first week of July, reached its maximum in the week ending 30th July and ended from the week ending 10th September.

Posters recommending the precautions to be taken including inoculations were affixed in various parts of the city. Inoculation stations through the kindness of the Medical Officers in charge were opened at the principal Hospitals in the City in addition to the 13 Stations provided at the Municipal Dispensaries. The total inoculations performed numbered 8,966.

In view of the magnitude of the epidemics of Cholera which occurred at this time in so many parts of India and the Bombay Presidency, the city may be regarded as fortunate in having escaped with an outbreak which did not in any one week produce more than 25 deaths.

Influenza.—The number of deaths registered as due to Influenza during the year was 79 and was 920 less than the average of the last ten years (1917-1926).

Tuberculosis.—The number of deaths from Tuberculosis was 1,748 and the death-rate 1.34 per 1,000 of the population. Of these, 1,577 were due to Phthisis (Pulmonary Tuberculosis) and 171 to other Tuberculous Diseases.

There were 859 deaths among males and 889 among females. The disease caused a greater number of deaths among persons in the age-group of 20 to 40 years than in any other age period.

There are two dispensaries for out-patients suffering from Tuberculosis—one at the Sanitary Institute, Princess Street, and the other in Foras Road and the Turner Sanatorium containing 32 beds for in-patients on Bhoiwada Hill, Parel.

Each dispensary is in charge of a Medical Officer and three nurses are employed for visiting the patients who attend, reporting on the home conditions and seeing that they follow in their homes the advice which they receive. Of the three nurses, two are employed at Princess Street and one at Foras Road.

During the year under report the total number of Tuberculous patients treated at the two Dispensaries was 1,406; the number treated in 1926 was 1,240.

Of the 1,406 cases, 1,211 were cases of Pulmonary tuberculosis and 195 cases of Surgical Tuberculosis. The total attendances numbered 11,573.

The Medical Officers and Nurses paid 3,046 domiciliary visits to see patients too ill to attend the Dispensary.

In the Turner Municipal Sanatorium at Bhoiwada, 32 beds, 18 for males and 14 for females, are provided for patients in the early stages of consumption. The use made of the Sanatorium and the results are shown in the following tabular statements:—

Number remaining over from previous year ..	23
Number of new admissions	108
Number remaining at the end of the year ..	27

Stage of the Disease.	*Males.*	*Females.*
Stage I (Early)	32	20
Stage II (Moderately advanced)	17	15
Stage III (Advanced) ..	14	10
TOTAL ..	63	45

Malaria was registered as the cause of 365 deaths. 1,633 deaths were registered as due to Ague and Remittent Fevers. Under the last two heads a number of deaths are no doubt included which were due not to Malaria but to one or other of the various diseases such as Typhoid, Tuberculosis and Influenza in which fever may be a prominent symptom.

The numbers of deaths from Malaria and from Ague and Remittent Fevers in 1927 were 365 and 1,633 and the annual averages in the ten years 1917-1926, were 417 and 3,117 respectively.

Measures for gauging the incidence of Malaria were continued during the year.

The inspection of houses and the destruction of larvæ were carried on on a systematic plan. The sections of the Wards were further sub-divided and each Overseer was given an area which he could cover within a week. The breeding places detected were immediately dealt with. Slight defects in the permanent breeding places were attended to by the Staff and action was taken against the owner only when the repairs were expensive and costly.

Children of the poorer classes were examined, for enlargement of the spleen in dwelling houses and in Charitable Institutions. Out of 5,342 children so examined 403 were found to have enlarged spleen. The spleen rate for the whole city was 7.54 against 7.97 in 1926 and 7.60 in 1925.

The total number of wells in the city should have been 3,003 according to last year's report. 148 wells were, however, discovered during the year. A few of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

these were new wells sunk without permission and were subsequently filled in. One well was permitted to be sunk.

Cisterns.—Defective non-mosquito-proof manhole covers were, in response to letters or notices, replaced by the new hinged iron standard caps under lock and key in 766 cases during the year. The total number of cisterns in the city is 25,846.

Tanks.—(1) Mill tanks. There are 88 mills in the city with 117 mill tanks. These tanks are always found to constitute a danger to Public Health by reason of their breeding mosquitoes frequently. The matter was taken up by the Malaria Advisory Committee appointed by Government for devising and co-ordinating anti-malarial measures in the city of Bombay. The Committee recommended that attention should be concentrated on the filling in of the tanks at once or gradually every year. But in view of the present depressed state of the industry, they recommended a scheme of oiling, pending the filling in of the tanks at a cost varying from Rs. 55 to 95 per mensem according to the size of tank. The scheme is to pour on the surface of the water one gallon of a mixture of three gallons of residual oil, two gallons of kerosine oil and two ounces of castor oil for every 25 linear feet if the tank is found breeding.

As an experimental measure the owners of the mills worked with electricity (and where the mill tanks were found breeding frequently) were advised to participate in the scheme which was brought into force from September 1927.

The owners are given the option of supplying their own oil, when Rs. 15 per mensem are charged for supervision and treatment of the tank when necessary.

Eleven mills have joined the scheme during the year.

The mill tanks were regularly examined and treated with larvicides if found necessary. 54 tanks were found breeding at some time or other during the year.

Quinine and Cinchona.—66 lbs. of quinine and 83 lbs. of Cinchona Febrifuge were supplied to patients and others free of charge through the 13 Municipal Dispensaries and other Municipal Agencies and at the Municipal Maternity and Infectious Diseases Hospitals. 1 lb. of quinine and 22 lbs. of Cinchona were distributed in the form of tablets numbering 46,106 in all. The remainder was issued in the form of powder.

Out of 46,106 tablets 9,138 tablets were distributed by Municipal Inspectors and others partly for treatment and partly for prophylactic purposes. The remainder of the supply of tablets and powder was administered in Medical Institutions to patients suffering or suspected to be suffering from malaria.

Venereal Diseases.—The number of deaths ascribed to Venereal Diseases during the year was 26 against 41 in 1926. Of the 26 deaths, 20 were due to Syphilis.

Early in the year 1918, a League for Combating Venereal Diseases was established in Bombay under voluntary management, with the Head Office, Information Bureau and an Outdoor Dispensary at No. 66, Lamington Road. The management was taken over by the Bombay Municipality from 1st April, 1925. At the Information Bureau, information and advice are given to the public and educational literature in English and the Vernaculars is distributed. Outdoor anti-venereal propaganda work is also carried out. The Dispensary is well equipped with all the necessaries for the free diagnosis and treatment of Venereal Diseases by modern methods. The Staff of the Dispensary consists of a Medical Officer in charge, a Lady Physician, a Nurse, and Dispensary and Laboratory Assistants.

A post-graduate course of training for qualified medical practitioners is held three times a year. It is conducted by the Medical Officer in charge at the Dispensary, where provision is made for laboratory instruction and ample facilities are available for clinical work. During 1927, eleven post-graduate students have received training and completed their courses.

During the year ending 31st December, 1927, the number of patients registered in the Dispensary was 2,844 (2,547 males and 297 females).

During the year under report 677 injections of Nov-arsenobillon were given and 611 Wassermann Tests were made, besides a very large number of other injections and tests.

Out of the 2,844 cases registered during the year, 253 ceased attending before the diagnosis was completed and 286 (234 males and 52 females) were diagnosed as non-venereal. The remaining 2,305 with the addition of 392 cases carried over from last year give a total of 2,697 (2,416 males and 281 females) venereal cases which are classified as follows:—

	Males.	Females.	Total.
Syphilis	714	78	792
Gonorrhœa ..	1,389	143	1,532
Soft Chancre ..	313	60	373
TOTAL ..	2,416	281	2,697

Municipal Dispensaries.—The thirteen Municipal Dispensaries were open throughout the year to administer, as in the past, free medical relief to the sick poor of the city.

The number of new cases treated at the dispensaries during the year was 68,887 (47,888 males and 20,999 females) as against 71,921 in 1926. The total attendances numbered 166,991 as against 192,626 in 1926. These figures include 888 visits by the Dispensary Medical Officers to patients in their homes.

Sanitary State of the City.—The principal causes of the insanitary conditions which maintain the death-rate at a high level even in non-epidemic periods are the insufficiency of the sewers, the continuance of the basket privy system of conservancy, the density of houses and persons per acre and the overcrowding of persons in rooms and tenements.

With the completion of the new Tansa pipe line, the city as a whole is now provided with an adequate and constant supply of water from Tansa lake. The whole supply has been chlorinated throughout the year. No provision of any kind is made for filtration.

NOTES ON THE ANNUAL STATEMENTS OF THE HOSPITALS AND DISPENSARIES IN THE CENTRAL PROVINCES AND BERAR FOR THE YEAR 1927. BY COL. J. NORMAN WALKER, M.R.C.P. (LOND.), D.T.M. & H. (CAMB.), I.M.S., INSPECTOR-GENERAL OF CIVIL HOSPITALS, CENTRAL PROVINCES. GOVERNMENT PRESS, NAGPUR, 1928. PRICE, RS. 6-7.

THERE were 314 hospitals and dispensaries at the close of 1926. During the year 1927, 10 dispensaries were opened and four closed leaving 320 institutions at work on 31st December, 1927. The following dispensaries were closed; Ghogra Irrigation dispensary, two mission dispensaries at Morpha and Champa and one railway dispensary at Mophani Collieries in the Narsinghpur district. During the year no dispensaries were transferred to Local Bodies but one cheap plan dispensary was opened at Babai under the management of the District Council, Hoshangabad. Another at Sandia in Sohagpur *tahsil* is to be opened during the year 1928 by the same District Council. Two dispensaries, one at Karanja in Wardha district and one at Shahpur in Betul district, were opened during the year under the management of the Dispensary Fund Committee and under the direct supervision of the Civil Surgeon. The re-opening of the dispensary at Garha under the management of the Jubbulpore Municipal Committee has been approved by Government and it will be re-opened shortly.

A cheap plan dispensary at Bamni has been opened by the District Council, Mandla, this year. Government's sanction to the opening of five cheap plan dispensaries under the management of the District Council Buldana, at Tamgaon, Bori-Adgaon, Lonar, Janephal and Amrapur has been received and these have begun work. Provision also exists in the next year's budget for 1928-29 for opening additional cheap plan dispensaries in Berar. The policy of Government in this matter is that local bodies should take the initiative and their applications to found cheap plan dispensaries are sympathetically considered and financial assistance given.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

HOMOGENTISURIA (ALKAPTONURIA) WITH GLYCOSURIA.

WITH NOTES ON A DETAILED CLINICAL AND CHEMICAL INVESTIGATION OF A CASE.

By J. P. BOSE, M.B., F.C.S. (Lond.),
Diabetes Research Worker, School of Tropical Medicine, Calcutta,
and
SUDHAMOY GHOSH, D.SC., F.R.S.E.,
Professor of Chemistry, School of Tropical Medicine, Calcutta.

Introduction.—According to Sir Archibald Garrod, "Alkaptonuria is an extremely rare anomaly and less than fifty cases in all have so far been recorded. In the great majority, at any rate, it is a congenital, lifelong, harmless peculiarity which is apt to occur in several brothers and sisters of a family. It is seldom directly transmitted from parent to child, but in a large proportion of cases, the subjects of it have been the offspring of consanguineous marriages."

It occurs in individuals, otherwise normal, whose urine, though of perfectly normal colour when freshly passed, turns black when exposed to air, especially if rendered alkaline.

Cuthbert (1923) reported the case of three alkaptonuric children who were the issue of marriages between first cousins. Debenedetti (1920) recorded a family with a higher proportion of alkaptonuric members, the issue of parents who were first cousins. In the present case, the patient's parents were relations, but the exact relationship between them could not be ascertained.

Cuthbert also notes that among the alkaptonuric members of a family, there is usually a much larger proportion of males than females. Lewis also supports this observation.

Garrod (1908) in an admirable monograph on the "Inborn errors of metabolism," has discussed the subject in some detail and has described these cases along with other anomalies (such as cystinuria, pentosuria, albinism) as "chemical malformations" of hereditary origin.

Though rare, medical men ought to know more about it and the modern methods for its recognition, so as not to mistake it for illness of a graver nature. It has been observed in infants from the earliest days of life. Alkaptonuria, as has already been stated, causes practically no discomfort to the person suffering from it, nor has it, so far as is known, any ill effect on the person's health. Some patients have complained of vague articular pains (e.g., in the case under report) and in others, a peculiar staining of the cartilages has been observed (Ochronosis, described by Virchow in 1886).

The first suspicion as to there being something wrong with the individual usually takes place when the alkaptonuric goes for life insurance. Homogentisic acid, which is present in the alkaptonuric urine, being a strong reducing agent, is mistaken for sugar and the person is refused. Some patients have brought to the notice of the doctors that the underwear gets deeply stained owing to the urine coming in contact with it. As a matter of fact, this latter peculiarity helps in its recognition at the very beginning of life and Garrod has recorded two cases in which the staining was noticed on the second day of life.

Alkaptonuria should prove to be of special interest to the chemical physiologist and pathologist. The study of this disease by eminent research workers of the type of Wilkow, Baumann, Marshall, Kirk, Boedeker and Garrod has materially helped to advance our knowledge of the intricate problems of protein metabolism.

On a review of the literature on the subject, it would appear that this disease was recognized nearly 350 years ago. Scribonius in 1584 mentioned the case of a school boy "who although he enjoyed good health, continuously excreted black urine." Schenck in 1609 cited the case of a monk "who exhibited a similar peculiarity and stated that he had done so all his life." In 1649, Zacutus Insitanus published a very interesting case of this nature. "The patient was a boy who passed black urine and who, at the age of 14 years, was submitted to a drastic course of treatment which had for its aim the subduing of the fiery heat of his viscera, which was supposed to bring about the condition in question, by charring and blackening the bile. Among measures prescribed were bleeding, purgation, baths, a cold and watery diet and drugs galore.....None of the predicted evils ensued, he married, begat a large family and lived a long and healthy life, always passing urine black as ink."

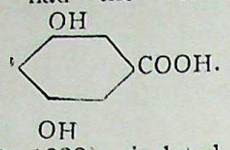
It must be mentioned here that these early workers did not draw any distinction between urine which was black when passed and that which darkened on exposure to air. To all intents and purposes, however, the cases referred to above point to the diagnosis of alkaptonuria. Marcet in 1823 accurately described the case of an infant whose urine darkened in colour on standing, this reaction being accelerated by the addition of alkali, and also noted the properties of the urine in staining linen. Marcet, however, failed to recognize the reducing properties of such urine. In 1858, Boedeker detected in the urine of a patient with glycosuria "a second reducing substance, not a sugar, to which, on account of its behaviour towards alkalies, he assigned the name of *alkapton*, a bilingual word derived from alkali and καπτειν (to absorb greedily)."

Marshall in 1887 isolated a substance from the urine of his patient and he designated it as glycosuric acid (because it had reducing properties like

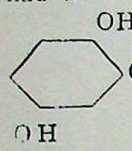
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

glucose); it had the following formula:—



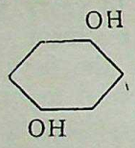
Kirk (1888, 1889) isolated an acid from alkaptonuric urine which he named uroleucic acid, having a melting point of 133.3°C., had to which he gave the following formula:—



$CH_2.CHOH.COOH$(Empirical—$C_9H_{10}O_5$).

It will thus be seen that these two workers, Marshall and Kirk, went very near to the isolation and composition of the abnormal substance in the urine which, however, was finally isolated five years later by Wilkow and Baumann (1891) and on investigation was found to have the empirical formula $C_9H_8O_4$, having a melting point of 146° to 147°C. Wilkow and Baumann's work has subsequently been confirmed by the work of Huppert, Frankel, Osborne, Otto Neubauer, Garrod and others.

Chemistry.—As the result of the investigations of the workers mentioned above, it was definitely proved that the constitution of homogentisic acid is 2,—5-dioxy-phenyl acetic acid (hydroquinone acetic acid) and its structural formula is as follows:—



Its melting point, as has just been said, is between 146° and 147°C.

Homogentisic acid is believed to be derived from phenyl-alanine and tyrosine in the body, and it has been experimentally proved that, in alkaptonuric individuals, the homogentisic acid is markedly increased when phenyl-alanine or tyrosine is administered by mouth (Falta & Langstein, 1902 and 1903). Protein foods have also been found to increase the output of homogentisic acid in these individuals. The usual average output of homogentisic acid in the urine of alkaptonuric individuals is stated to be from 3 to 6 grammes daily.

From a study of experimental observations, it appears that alkaptonuria results from a disturbance of the catabolism of the amino-acids, particularly tyrosin and phenyl-alanine, in such a way that the final cleavage of the benzene ring beyond the stage represented by homogentisic acid is no longer possible in these individuals. Garrod also supports this theory.

Treatment.—On reviewing the literature, very little information is obtained regarding the treatment of this anomalous condition.

Various remedies have been tried and suggested by different authorities; Wilkow and Baumann, for instance, suggested that this condition might have its seat in the intestines of alkaptonurics, being brought about by the influence of "a rare specific micro-organism." This infective theory has now been completely abandoned, because intensive intestinal disinfection has no influence upon the excretion of homogentisic acid by alkaptonurics nor can any "specific" organism be grown from their fæces.

Barr and Frend (1926) injected serum and milk in an infant 10 months old with alkaptonuria. The excretion of homogentisic acid dropped after the injection.

Vohtz (1924) suggested that restriction of albumen intake, specially of casein, should be tried.

Potassium iodide has also been recommended.

In the case under report, investigation as regards treatment by various agents (both dietetic and medicinal) is still being carried on, but the results obtained so far are not of sufficient importance to justify publication.

Case.

R. M., Madrassi Hindu male, age 55 years, was admitted under one of us (J. P. B.) in the Carmichael Hospital for Tropical Diseases for "long standing diabetes" on the 14th July, 1928. The patient was a healthy well-built man of short stature.

Family history.—Father died at the age of 55. His mother, (the second wife of his father) was still living. The patient stated that his parents were relations but the exact relationship he was not aware of. He had 5 brothers and 2 among them were said to be diabetic. Sisters were four in number.

Past History.—The patient said that he had always been a sober man and had never touched alcohol in his life, nor did he eat fish, meat or eggs, being a high caste Hindu. He smoked tobacco moderately. His chief diet had always been rice, dal, vegetables, milk, butter, etc. The patient stated that his clothes used to be stained chocolate brown from birth and that his mother who noticed it used to remark that he would not live long.

Present complaints.—Vague fleeting articular pains in nearly all the joints of his body; duration about 12 years. Frequency of micturition and thirst; duration, the same. The patient had never had his urine examined before. Appetite good. Bowels regular. General appearance, good.

Physical examination.—Mouth, pyorrhœa; tongue, coated and moist. No enlarged cervical or submaxillary glands. Movements of chest, normal. In both lungs, a few rhonchi present, otherwise breath sounds normal. Anæmia, nil. Jaundice, nil.

Circulatory system.—Blood-pressure.—Systolic: 115, diastolic: 80. Apex beat, normal; no cardiac abnormalities found. Response to exercise, good. Pulse, normal; no evidence of arterio-sclerosis.

Abdomen.—Liver, not enlarged. Spleen, not enlarged. Stomach, normal. Colon, normal.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Nothing abnormal in the *genito-urinary* system. Nothing abnormal in the nervous system or in the special senses.

Blood reaction for syphilis: Wassermann test, negative.

Blood for parasites: no parasites.

Date.	Diet.	Carbo-hydrate.	Food-value in diet.			Body—Wt. (lbs.)	Remarks.
			Protein.	Fat.	Calories.		
15-7-28 ..	Milk—1 seer. Rice—8 oz. Green veg.—16 oz. Bread—8 oz. Butter—1 oz. Curry stuff—4 oz. Mustard oil—2 oz. Tea—1 oz.	356·0	74·4	124·3	2837·6	103¼	No attempt was made to restrict the carbohydrate. The patient was allowed a liberal diet. As for medicines, only mist. alba was given s. o. s. to keep bowels regular.
17-7-28 ..	Milk—1 seer. Rice—4 oz. Green veg.—12 oz. Bread—8 oz. Butter—1 oz. Mustard oil—2 oz. Dal—2 oz.	289·4	79·1	124·7	2601·7	..	....
20-7-28 .	Same as above plus :— Green veg.—4 oz. Chappati—2 oz.	332·7	85·4	126·8	2824·1	..	Blood-sugar : 0·196 per cent.
25-7-28 ..	....	....	..	..	....	102	Blood-sugar : 0·172 per cent.
30-7-28 .	Same as on 20-7 plus :— Rice—2 oz.	379·9	88·2	127·3	3028·3	103¾	....
3-8-28 .	Same as above plus :— Milk—4 oz.	385·1	92·6	132·1	3108·3	..	Blood-sugar : 0·148 per cent.
19-8-28 .	Milk—1¼ seer. Rice—6 oz. Green veg.—12 oz. Bread—8 oz. Butter—2 oz. Curry stuff—2 oz. Mustard oil—2 oz. Dal—2 oz. Potatoes—4 oz. Chappati—2 oz.	404·3	93·6	132·5	3196·3	106½	....
21-8-28 ..	Same as above plus :— Chappati—1 oz.	423·9	96·3	133·5	3297·5	..	....
30-8-28 ..	....	..	..	..	....	107¼	Blood-sugar : 0·236 per cent.
5-9-28 ..	....	..	..	..	....	107¼	Blood-sugar : 0·240 per cent.

LABORATORY TESTS.

Blood.

Blood reaction for kala-azar: antimony test in serum,—negative, aldehyde test in serum,—negative.

Blood reaction for T.A.B., Widal test, T., 1|10, A.B., 1|20.

Blood reaction for dysentery: agglutination against dysentery bacilli, negative.

The serum was tested for homogentisic acid but the result was negative.

Blood chemistry.

Blood sugar, 0.160 per cent. or 160 mgs. per 100 c.c.

Blood, non-pratun nitrogen 0.025 per cent. or 25 mgs. per 100 c.c.

Blood urea, 0.015 per cent. or 15 mgs. per 100 c.c.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Blood uric acid, 0.0019 per cent. or 1.9 mgs. per 100 c.c.

Blood count.

Hæmoglobin, 95 per cent.
Red Blood Corpuscles, 5,590,000 per c.mm.
White blood cells, 9,800 per c.mm.
Polymorphonuclears, 64 per cent.
Small mononuclears, 31 per cent.
Large mononuclears, 4 per cent.
Eosinophiles, 1 per cent.
Parasites, nil.

Stools.

No non-lactose fermenters. Oxyuris and ascaris ova, and *E. histolytica,* all present.

X-Ray examination could elicit nothing abnormal in the joints.

Body-weight on admission.—104¼ lbs.

FUNCTIONAL TESTS.

Lævulose-tolerance test.

Blood-sugar before giving lævulose, 0.160 per cent.

Blood-sugar 1 hour after 25 gms. of lævulose, 0.130 per cent.

Blood-sugar 1½ hours after 25 gms. of lævulose, 0.146 per cent.

Result.—Normal.

Van den Bergh's test.—Normal.

Glucose tolerance test:—

Blood-sugar before giving glucose ..	0 164 per cent.
„ ½ hour after 50 grammes of glucose	0·224 „
Blood-sugar 1 hour after 50 grammes of glucose	0·320 „
Blood-sugar 2 hours after 50 grammes of glucose	0·238 „

Remarks.—Sugar tolerance definitely defective.

Kidney function test.—Result of Maclean's urea-concentration test—*normal.*

Chemical examination of the urine:—

Colour.—Straw and clear when freshly passed, but on the surface being exposed to air, it gradually darkened in colour. This reaction was found to be accelerated by the addition of alkalies. This is represented in the photograph given below (Fig. 1).

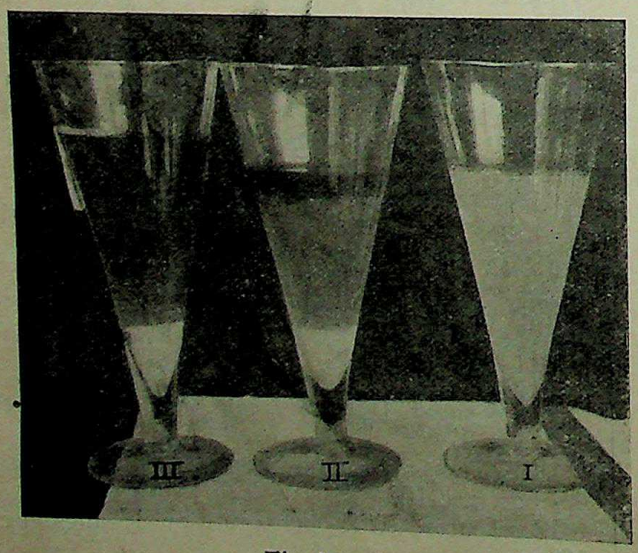


Fig. 1.

Specimen marked I, is a sample of freshly passed urine. Note that the colour is perfectly uniform.

Specimen marked II, is a sample of urine from the same patient allowed to stand exposed for 6 hours. Note that the top layer of the urine about an inch deep has turned jet black. The lower portion of the urine also is gradually turning darker.

Specimen marked III, is another sample of urine from the same patient exposed for 18 hours. Note that nearly the whole of the sample has turned inky black.

Reaction.—The freshly passed urine was found to be acid in reaction, but when exposed for a short time, it gradually turned alkaline along with the darkening in colour noted above.

Tests for albumen, diacetic acid, indican and urobilin were all negative.

Nothing abnormal was detected on microscopical examination.

Tests for sugar:—

(1) *Fehling's test.*—When the urine was added to Fehling's solution in the cold, the deep blue colour of the reagent became gradually lighter and finally assumed a greyish-black colour with a greenish tinge. When the Fehling's solution and the urine were boiled separately and then mixed, the above change took place immediately with the formation of a definite precipitate.

It may be noted here that these characteristic changes are quite unlike those due to the presence of sugar alone in the urine.

(2) *Benedict's test.*—Benedict's solution treated with the urine gave results similar to the above.

(3) *Nylander's test.*—Nylander's solution in the cold turned dark brown when the urine was added. On boiling, a precipitate was observed.

(4) *Fermentation test.*—The urine incubated in Einhorn's tube for 18 hours with brewers' yeast, gave definite evolution of CO_2.

(5) *Osazone test.*—Some crystals of phenyl-glucosazone were observed by treating the urine with phenyl hydrazine hydrochloride. The presence of glucose was further established by separating the homogentisic acid and preparing the glucosazone in the following way:—

The urine was treated with a solution of basic lead acetate until there was no more precipitate. The filtrate was freed from lead by treating with H_2S. It was filtered again and H_2S was removed by boiling. The clear solution was then treated with phenyl hydrazine and acetic acid and a fair amount of definite yellow crystals characteristic of phenyl-glucosazone was obtained. The separation of these crystals in a purer form and the determination of their melting point are described later on.

The tests mentioned above gave us a definite clue as to the presence of homogentisic acid in the urine, *besides glucose.* After applying some of the recognised tests for homogentisic acid in the urine, the following results were obtained:—

(1) When treated with ammonia and shaken in contact with air, there was a gradual deepening of colour from brownish red to dark brown.

(2) With a dilute solution of ferric chloride, a fleeting blue colour was observed. This reaction is very rapid and must be observed very carefully.

(3) With silver nitrate solution (about 10 per cent.) a gradual reduction to metallic silver took place even in the cold.

(4) With an ammoniacal solution of silver nitrate, the above reaction was much more rapid.

(5) A few drops of an ethereal extract of urine, when dropped upon a little powdered lime (CaO), developed a blue colour which gradually disappeared again.

These results left us in no doubt as to the presence of homogentisic acid in the urine and we proceeded to isolate it, and estimate it quantitatively in the following way.

Isolation and purification of homogentisic acid:—

The urine was acidified with sulphuric acid (1 in 12), using 75 c.c. of the dilute acid for every litre of urine, and evaporated on the water-bath to about 1|10th of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

its bulk. Three litres of urine were treated in this way. The concentrated residue was taken in a separating funnel and shaken repeatedly with ether until the homogentisic acid was exhausted. Most of the ether was recovered and the concentrated ethereal solution, treated with freshly ignited anhydrous sodium sulphate to remove all moisture and the impurities held in solution, was then filtered and the ether evaporated. The residue was taken up in water and filtered from fatty and other impurities. The aqueous solution was warmed on the water-bath and a concentrated, (about 50 per cent.) hot, aqueous solution of neutral lead acetate added and quickly filtered from the slight amount of precipitates that had formed. On cooling, a large quantity of crystalline precipitate appeared. When observed under the microscope, the crystals were seen to possess the characteristic needle shape of lead homogentisate $(C_8H_7O_4)_2$ Pb. $3H_2O$ as described by Garrod and others (see Fig. 3). The crystals were left overnight to settle in a cool place and filtered the next day. They were washed with a little cold water, dried on a porous plate and then left in a vacuum desiccator over concentrated sulphuric acid. The first precipitate with lead acetate obtained above was also treated in the same way. It was found to be somewhat impure lead-homogentisate and was not mixed with the second purer lot used for the preparation of pure homogentisic acid. Both the dry lead precipitates were weighed and used for the estimation of homogentisic acid (see later). For the preparation of homogentisic acid, the second purer lot of the dry powdered lead salt was suspended in ether in a conical flask, cooled over ice-water, and a current of sulphuretted hydrogen passed for about half-an-hour. The etheral solution was filtered into a weighed glass dish and the residual lead precipitate again suspended in ether and treated with H_2S. The process was repeated until all the lead homogentisate was decomposed. The ether was removed and the residue dried in a vacuum over sulphuric acid. The homogentisic acid thus obtained was crystalline and of a light yellow tinge. It was purified by dissolving it in a very small amount of hot absolute alcohol and adding pure chloroform to it. On scratching with a glass rod, colourless crystals separated and were rapidly dried on a porous plate and washed with a little chloroform. The crystals melted at 146°C. (theoretical 146°-147°) and appeared under the microscope as colourless transparent leaflets (see Fig. 2). They were easily soluble in water, alcohol and ether but almost insoluble in chloroform and benzene.

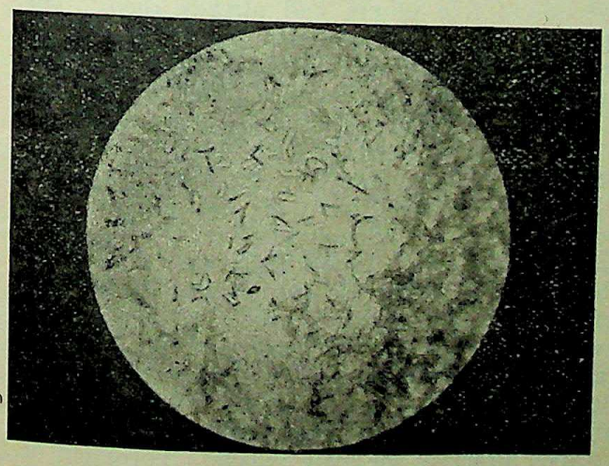


Fig. 2.

Reactions observed with the pure homogentisic acid isolated as above:—

(1) With ammonia, caustic soda or sodium carbonate, the aqueous solution turned brown and the colour deepened gradually.

(2) An aqueous solution reduced silver nitrate even in the cold. An ammoniacal solution of silver nitrate was rapidly reduced even is the cold.

(3) Ferric chloride added drop by drop to an aqueous solution of homogentisic acid produced a fleeting blue colour.

(4) An aqueous solution gave a lemon yellow colour and finally a precipitate with Millon's reagent. The precipitate turned brick-red on warming.

(5) An ethereal solution of the acid when dropped upon a thin layer of lime (CaO) developed a beautiful deep blue colour which soon disappeared again.

Derivatives of homogentisic acid:—

(1) *Lactone.*—On heating the pure acid in a dry test-tube, prismatic crystals of lactone sublimed on the upper part of the tube.

(2) *Lead homogentisate.*—$(C_8H_7O_4)_2$ Pb. $3H_2O$. A hot aqueous solution of the pure acid was treated with a concentrated (50 per cent.) clear aqueous solution of neutral lead acetate and on cooling, a copious colourless crystalline precipitate came out. Under the microscope, the crystals were found to consist of long colourless needles (see Fig. 3). The crystals were washed with a little water, dried on a porous plate and finally in a vacuum over H_2SO_4. They melted at 210°C.

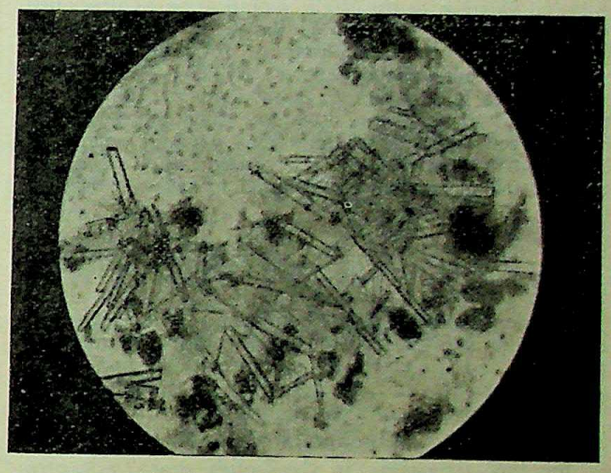


Fig. 3.

(3) *Di-benzoyl-homogentisamide,* C_6H_3 $(O.C_6H_5CO)_2$. $CH_2.CO.NH_2$. About 0.5 gramme of homogentisic acid was dissolved in a little water in a conical flask, some dilute NaOH added until it was alkaline and then about 2 c.c. of conc. ammonia. About 5 c.c. of benzoyl chloride was then poured in and the flask shaken constantly while the liquid was kept alkaline with constant addition of small amounts of 40 per cent. NaOH. When the odour of benzoyl chloride disappeared, the flask was kept aside to settle. The red-coloured crystals which separated out of the alkaline solution were filtered and washed with warm water. They were then crystallised from boiling absolute alcohol with the addition of some animal charcoal. The colourless crystals obtained were again recrystallised from absolute alcohol and finally dried *in vacuo* over H_2SO_4. Colourless needles appeared of which the melting point was 202°C.

Confirmation of the presence of glucose:—

The concentrated aqueous solution (from 3 litres of urine), after extraction of homogentisic acid with ether, was neutralised with caustic soda, filtered and made up to a known volume (see estimation of glucose). A portion of the aqueous liquid was treated with basic lead acetate until there was no more precipitate. It was filtered and the filtrate freed from lead by H_2S. The filtrate from PbS was freed from H_2S and the rotation of the solution examined in a delicate polarimeter. The solution was found to be dextro-rotatory and pointed to the presence of "d"-glucose. It was further confirmed by the preparation of osazone from the same solution with the help of phenyl hydrazine and acetic acid. The osazone was recrystallised twice from alcohol and dried in a vacuum desiccator over

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

H_2SO_4. It melted at 110°C. (melting point of phenyl-glucosazone on somewhat rapid heating, 110°C.). The crystals seen under the microscope had the characteristic needle-like shape of phenyl-glucosazone.

Approximate estimation of glucose:—

An aliquot part of the neutral aqueous solution used for the preparation of osazone, was treated as before with basic lead acetate and filtered quantitatively. The filtrate was freed from lead and subsequently from H_2S and made up to a known volume. From the amount of reduction of Fehling's solution observed, the concentration of sugar, calculated as glucose, was found to correspond to 0.30 per cent. of glucose in the original urine. The amount obtained by observing the rotation was somewhat lower, owing perhaps to partial racemisation by heat.

Estimation of homogentisic acid.—We first tried the simple method suggested by Garrod (1898) for the estimation of homogentisic acid directly from the fresh urine, but the method was not found satisfactory, owing perhaps to the smaller excretion of homogentisic acid in the present case than in those observed by Garrod. The method of Wilkow and Baumann was therefore followed by us with the slight modification as described before under the isolation of the acid. The total dry lead homogentisate amounted to 6.42 grams. Since 1 gram of lead homogentisate $(C_8H_7O_4)_2$. Pb. $3H_2O$ is equivalent to 0.564 gram of homogentisic acid $C_8H_8O_4$, the lead homogentisate isolated from 3,000 c.c. of urine is equivalent to 6.42 by 0.564 or 3.62 grams of homogentisic acid. Hence the concentration of homogentisic acid present in the original urine,

$$\frac{3.62 \times 100}{3000} = 0.12 \text{ per cent.}$$

The daily excretion of homogentisic acid was not constant, as was noticed by the physical appearance of the urine, and the above figures for glucose and homogentisic acid are only for a particular period.

The name *alkaptonuria* should in our opinion be changed to *homogentisuria*. The old name which had its origin in the belief that "alkapton bodies" were excreted in the urine, cannot be supported any longer after it has been definitely proved that it is homogentisic acid that is responsible for these peculiar reactions in the urine. We, therefore, suggest the name "homogentisuria," like similar scientific names such as glycosuria, pentosuria, albuminuria, etc.

In conclusion, we desire to express our best thanks to Mr. U. N. De, B.SC., Research Chemist, Diabetes Inquiry, for helping us in our experiments. We also desire to thank Sister North and Staff Nurse Vardon for helping us in the collection of materials.

REFERENCES.

Barr and Frend (1926). *Journ. Amer. Med. Assoc.*, Jan. 30th, p. 384.
Boedeker (1859). *Zeitschrift für Rationale Medicin.*, Vol. VIII, p. 130.
Boedeker (1861). *Annalen der Chemic und Pharmacie.* Vol. CXVII, p. 98.
Cuthbert (1923). *Lancet*, March 24th, p. 593.
Debenedetti (1920). II. *Policlinico*, XXVII, p. 1379.
Falta and Langstein (1902-1903). *Hoppe Seyler's Zeitschr. f. physiol. Chem.*, Bd. 37, p. 513.
Garrod, A. E. (1898). A Simple method for the Extraction of homogentisic acid from the urine. *Journ. Physiol.*, Vol. 23, p. 512.
Garrod, A. E. (1908). *Lancet*, Vol. II, p. 73.
Kirk (1888). *Brit. Med. Jour.*, Vol. II, p. 232.
Kirk (1889). *Journ. Anat. and Physiol.*, Vol. XXIII, p. 69.
Marcet (1823). *Trans. Roy. Med. and Chirurgical Soc.*, Vol. XII, p. 37.
Marshall (1887). *Med. News, Philadelphia*, Vol. I, p. 35.
Schenck (1609). *Observ. Med. Lib.*, III, p. 558.
Scribonius (1584). *De Inspectione Urinarum*, p. 50.
Vohtz (1924). *Journ. Amer. Med. Assoc.*, May 3.
Wilkow and Baumann (1891). *Zeitschrift. für Physiologische Chemie.*, Vol. XV, p. 228.
Zacutus Lucitanus (1649). *Praxis Med. Admiranda*, Lib. III, Cap. CXXXIV.

THE SPREAD OF DYSENTERY IN A KHASI VILLAGE AND ITS TREATMENT WITH BACTERIOPHAGE.*

By B. K. PAL CHOUDHURY, B.SC., M.B.,
and
J. MORISON,
LIEUTENANT-COLONEL, I.M.S.,
Pasteur Institute, Shillong.

ON the 7th May two men came from the village of Sohjarang saying that the villagers of a neighbouring village, Nongsier, had nearly all died of dysentery and that now Sohjarang was affected, many were ill and three children had died.

Sohjarang is a Khasi village in the jungle 12 miles west of the Shillong-Gauhati Road. It consists of 29 houses and 161 inhabitants. The main village has 24 houses clustered on the slopes of a hill and a smaller part consists of 5 houses on a neighbouring hill. This portion is referred to as U. Pher's village.

The people of Nongsier are related to families in Sohjarang and, though ten miles separate the two villages, there is frequent intercourse and there is a reasonable probability that, as the villagers affirm, the disease came from Nongsier.

On Dr. Choudhury's arrival there on the 9th May he found 68 persons actually ill with dysentery; five others had already died. The epidemic seems to have begun on the 25th April and within three days there were eleven cases in seven houses distributed through the village. The epidemic seems divisible into three waves. The first lasting from the 25th April till the 30th April, the second from the 1st May to the 7th May and the third from the 8th May till the occurrence of the last case on the 17th May. In each wave the cases were distributed throughout the village. The disease did not begin at one end of the village and spread to the other nor is there evidence that there was any concentration of cases in adjoining houses. Only two houses, the one occupied by a mission teacher who lives alone and the other by a woman also living by herself, escaped attack in the main village. Three out of five houses escaped in U. Pher's hamlet.

The scattered distribution of the cases in each of the three outbursts and the absence of any concentration of the cases is against the spread

*Read at the Annual Meeting of the Assam Branch of the British Medical Association.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of the infection by contacts or by flies. The successive waves and the scattered distribution suggest a distribution by water.

The water supply of the main village comes from a spring buried in jungle to the east of the village. So dense is the jungle that the spring is inaccessible to human beings. The jungle is not used for purpose, of nature. The water is led out of the jungle through a bamboo pipe from the end of which water is drawn.

The houses of the village are on bamboo platforms one end of which almost rests on the hill and the other is supported by posts several feet high. On the half of the platform next the hill is the grass hut. The other half is uncovered and is used for sitting out, and for drying food and clothes. In this part of the platform is a hole which is the latrine. The night-soil, dropping on the ground below, is disposed of by the pigs, of which each hut has one or more. The pigs have only the small stream of water from a bamboo pipe to drink from but they also can find their way to the spring in the jungle.

Dr. Choudhury had the jungle cut and exposed a pool of water 30 feet long, 2 feet wide and 16 inches deep. The bamboo pipe led off from the lower end of the pool. He had a fence put round the pool on the 11th May and the last case occurred six days later. There were no new cases during the remaining six days of his stay.

It would seem that this epidemic was water-borne and that the pool was successively infected by pigs that had fed on dysenteric stools.

The object of Dr. Choudhury's visit was to test the use of bacteriophage under village conditions. Six villagers were each placed in charge of five houses and the bacteriophage diluted with water was sent round in bottles. A dose of 2 c.cm. in about 4 oz. of water was given to every sick person on the first day three times and subsequently twice daily.

No milk was available in the village and the only food that could be given to the sick was a paste of boiled rice and water. They were given as much water as they cared to drink.

Dr. Choudhury brought clinical reports of all the cases. They are divisible into severe cases who were passing stools 'constantly'; moderately severe cases with 6 to 15 stools a day with or without fever; and mild cases with less than 6 stools a day. All were actually passing dysenteric stools.

The results were:—

	Severe.	Moderately severe.	Mild.
Number ..	18	19	43
Deaths ..	3	0	0

The deaths were two infants and one adult. One infant when first seen had extensive aphthous ulceration of the whole mouth resembling the action of a corrosive acid. The other was so feeble that it could not be fed. The adult had been eight days ill and passed blood and mucus every few minutes. Six days later the stools became fæcal and were reduced to three but the patient was so feeble that she could not swallow food. Only a severe case, not included in the statistics, refused treatment and was still ill when Dr. Choudhury left after 14 days' stay.

Of those treated all but seven had by that time resumed their work. One, a moderately severe case, walked to Shillong and back (a total distance of 50 miles) within a week of his illness with no ill effect.

The seven remaining cases were convalescent and a few days later were reported by the headman to have recovered.

Forty-three samples of stools were sent day by day to the Pasteur Institute, Shillong. The journey took 24 hours but notwithstanding this delay *B. dysenteriæ* (Shiga) was isolated three times and *B. dysenteriæ* (Flexner) four times. The outbreak was one of bacillary dysentery. It seems to have been caused by pigs and the treatment of the cases with bacteriophage under singularly difficult conditions gave satisfactory results.

BERBERINE IN THE TREATMENT OF ORIENTAL SORE.

By ASSISTANT SURGEON B. M. DAS GUPTA,
Assistant Professor of Protozoology,
and
B. B. DIKSHIT, M.B., B.S., D.P.H.,
Department of Pharmacology,
School of Tropical Medicine and Hygiene, Calcutta.

BERBERINE is an alkaloid chiefly obtained from the bark of *Berberis vulgaris* and other species of barberry, although it also occurs in certain proportions in hydrastis, calumba, etc. The alkaloid and its salts are bright yellow in colour and possess an intensely bitter taste. This latter property has been made use of in therapeutics and the drug has been used as a bitter tonic. It has also been used in diarrhœa and in the diagnosis of latent malaria (sabutini, 1928), its use in therapeutics, however, being very limited. The alkaloid berberine has the formula $C_{20}H_{17}NO_4$. Its salts—the hydrochloride and the sulphate—are sparingly soluble in water. The latter is the more soluble—the solubility being approximately 1 in 100.

Although the drug has been included in the pharmacopœia for a number of years, its remarkable effect in the treatment of local leishmaniasis was observed only recently. Varma (1927) was the first to use berberine sulphate successfully in the treatment of oriental sore. He refers to the work of Jolly (1911) who tried "rasout", a paste made from berberis with not very satisfactory results. Varma tried the paste but found it useless and initiated the use of berberine sulphate given hypodermically, infiltrating the sore. With this method he obtained remarkable results, the sore completely healing up after 2 or 3 injections given at weekly intervals.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Karamchandani (1927) studied a few different methods of treating the sore and reported that the injection of berberine sulphate was the most successful of all. The drug, as far as we know, did not receive any clinical trials after this, and no laboratory study of its action on *Leishmania tropica* has been made up to the present. We, therefore, under the guidance and at the suggestion of Lieut.-Cols. H. W. Acton and R. N. Chopra undertook to study the effects of the drug clinically as well as in the laboratory.

The toxicity of berberine sulphate was studied on cultures of *Leishmania tropica* and *L. donovani*. To seven tubes containing 4.9 c.c. of a modified N.N.N. medium, 0.1 c.c. of sterile distilled water containing different amounts of berberine sulphate was added, so as to give total dilutions of the drug varying from 1 in 1,000 to 1 in 100 million. The seventh tube was kept as a control. The tubes were incubated for 24 hours to test their sterility and then inoculated with a four-day-old culture of *L. tropica* and of *L. donovani*. After incubating for four days at 22°C., the tubes were examined for the growth of the organisms. The following table explains the results obtained.

TABLE I.

Shows the growth of flagellates obtained after inoculating tubes of N.N.N. medium containing varying quantities of berberine sulphate with L. tropica and L. donovani.

GROWTH + NO GROWTH −

	Concentration of berberine sulphate.						
	1−1,000	1− 10,000	1− 100,000	1− 1 mil.	1− 10 mil.	1− 100 mil.	Control.
L. tropica ..	−	−	+	+	+	+	+
L. donovani ..	−	−	+	+	+	+	+

It will be seen from the table given above that a 1 in 10,000 concentration of the drug inhibits the growth of *L. tropica* as well as of *L. donovani*, while a strength of 1 in 100,000 does not inhibit the growth of these organisms. To determine the toxicity more accurately the experiment was repeated as before, using concentrations varying between 1 in 10,000 and 1 in 100,000. The results are tabulated below.

TABLE II.

Shows the growth of flagellates obtained after inoculating tubes of N.N.N. medium containing concentrations of berberine sulphate varying from 1 : 10,000 *to* 1 : 90,000 *with L. tropica.*

GROWTH + NO GROWTH −

	Concentration of berberine sulphate.									Control.
	1− 10,000	1− 20,000	1− 30,000	1− 40,000	1− 50,000	1− 60,000	1− 70,000	− 80,000	1− 90 000	
L. tropica	−	−	−	−	−	−	−	−	+	+

A dilution as high as 1 in 80,000, therefore, completely inhibits the growth of the organism.

A comparative study with protoplasmic poisons like quinine and emetine was then made to determine the toxicity of these powerful alkaloids on the growth of *L. tropica*. The following table gives an idea of the relative action of these drugs on the growth of *L. tropica*.

TABLE III.

Shows the growth of flagellates obtained after inoculating tubes of N.N.N. medium containing various proportions of quinine and emetine with L. tropica.

GROWTH + NO GROWTH −

	Concentration of the alkaloid.						
	1−1,000	1−10,000	1−100,000	1−1 mil.	1−10 mil.	1−100 mil.	Control.
Emetine hydrochlor. ..	+	+	+	+	+	+	+
Quinine bi-hydrochlor. ..	−	+	+	+	+	+	+

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Only quinine, in strength as high as 1 in 1,000, is able to inhibit the growth of the organism, whilst in 1 : 1,000 emetine they were still alive.

We next tried the effect of Stibosan, which is a popular remedy for oriental sore and visceral leishmaniasis, on the growth of *L. tropica*. The results are tabulated below.

TABLE IV.

Shows the growth of flagellates obtained after inoculating tubes of N.N.N. medium containing different amounts of Stibosan with L. tropica.

GROWTH + NO GROWTH —

	Concentration of Stibosan.						
	1—1,000	1—10,000	1—100,000	1—1 mil.	1—10 mil.	1—100 mil.	Control.
L. Tropica ..	+	+	+	+	+	+	+

As will be seen from the table given above Stibosan even in concentrations as high as 1 in 1,000 does not check the growth of *L. tropica*. Still stronger concentrations were, therefore, prepared to try to determine the strength of Stibosan which can effectively check the growth of this parasite. In these experiments 0.5 c.c. of distilled water containing varying amounts of Stibosan was added to 9.5 c.c. of culture medium so as to give total dilutions ranging from 1 in 500 to 1 in 100. To reach the strength of 1 in 100, 0.5 c.c. of a 1 in 5 solution of Stibosan was used, and as higher strengths than 1 in 5 could not be prepared, it was found impossible to study the effect of the drug in total concentrations higher than 1 in 100. From the table given below, it will be seen that even as high a concentration as 1 in 100 does not at all affect the growth of the organisms.

In the case of Stibosan, in a strength of 1 in 20 the organisms were quite active after 3 hours 14 minutes.

Experiments were also made to see if berberine sulphate, given in the strengths used in therapeutics produces any local action on the tissues. Intramuscular injections of 1.5 c.c. of a 1 per cent. solution of berberine sulphate were given between the gluteal muscles of cats and rabbits. The animals were killed after 6 and 24 hours. In no case was there any naked eye evidence of inflammation or necrosis.

Pathological examination of the gluteal muscle of a rabbit in which an intramuscular injection of 1.5 c.c. of a 1 per cent. solution of berberine sulphate had been given 24 hours previously, showed that the upper surface of the muscle had dilated vessels. The endothelial cells were large and swollen. There was no leucocytic migration.

TABLE V.

Shows the growth of flagellates obtained after inoculating tubes of N.N.N. medium containing different amounts of Stibosan with L. tropica.

GROWTH + NO GROWTH —

	Concentration of Stibosan.					
	1— 100	1— 200	1 - 300	1— 400	1— 500	Control.
L. tropica ..	+	+	+	+	+	+

Stibosan evidently has no direct action on *L. tropica* whereas berberine sulphate in dilutions as high as 1 in 80,000 definitely inhibits the growth of the parasite.

A comparative study of the behaviour of *L. tropica*, when brought into contact with different strengths of berberine sulphate and Stibosan was made by direct observation under the microscope. Berberine sulphate in a strength of 1 in 200 kills the leishmania immediately. Weaker solutions were also tried, but as they do not kill the organisms immediately and formed a precipitate with the blood of the media, no inference could be drawn from the experiments.

The under surface of the same muscle showed a good deal of lymph between the muscular bundles for some depth into the muscle. The endothelial cells were well seen. No leucocytic migration was evident. Berberine sulphate causes simple dilatation of the vessels in the neighbourhood followed by simple œdema. Tissues are not necrosed.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In one rabbit 0.75 c.c. of a 2 per cent. solution of the acid sulphate of berberine was also tried and there was no indication of any inflammation. The drug, therefore, can safely be given in 1 or 2 per cent. solutions hypodermically or intramuscularly. The greater solubility of the acid sulphate makes it possible to give smaller amounts of fluid and minimises the discomfort produced by larger amounts. The actions of the two salts are identical.

Berberine sulphate was also tried clinically in cases of oriental sore and gave very satisfactory results.

Technique.—1 to 2 c.c. of a 1 per cent. solution of the sulphate or 0.5 to 1 c.c. of a 2 per cent. solution of the acid sulphate, according to the size of the sore, is injected as follows. The needle is inserted just above the margin of the sore and the solution injected near its edge. Four or more punctures are made so as to infiltrate the sore from all sides. The injections are repeated a week after and as a rule not more than three injections are required to bring about a complete cure. Two injections are often quite sufficient.

The solutions are very stable and can be preserved in sterile tubes with rubber caps, requisite amounts being withdrawn by the syringe whenever required. The treatment is not very painful and does not involve any risk as the injections are given locally. No expert skill is required to give the injections and the treatment can be given in any outlying dispensary by any medical man, the only apparatus required being a simple hypodermic syringe. The drug is very cheap: the approximate cost of the drug required for treating one sore being somewhat less than 3 pice.

Following is a summary of reports of cases treated with berberine sulphate:—

Case No: 1.—B. C. Hindu male, age 13 years.

An ulcer about the size of an eight-anna piece on the forearm. Duration 4½ years. Smear from the edge showed a large number of *L. tropica.*

Six injections of stiburea commencing from 0.05 grm. and rising up to 0.15 grm. were given twice a week, without any improvement in the lesion.

Two injections of berberine sulphate were then given by the infiltration method using 1.5 c.c. of a 1 per cent. solution. The scab fell off leaving a raw surface and the sore was then dressed with ung. zinci for 3 or 4 days. The sore healed up perfectly.

Case No. 2.—Mrs. P. Hindu female, age 32 years.

Lesions.—Two ulcers on fore-head, 1 on cheek, 2 on the back of wrist.

Duration.—The oldest one appeared 8 months back.

Lab. findings.—Parasites present in all lesions.

Each sore was treated with 3 weekly injections of 1.5 c.c. of 1 per cent. solution of berberine sulphate. All healed up within a month.

Case No. 3.—Mr. B. Hindu male, age 50 years.

Lesions.—Three sores on fore-arm. All appeared about the same time.

Lab. findings.—Parasites present in all.

He had 2 injections of berberine sulphate 1.5 c.c. of 1 per cent. solution. Discharged cured.

Case No. 4.— Mr. S. Hindu male, age 45 years.

Lesions.—Two sores on the leg, both chronic, one of 8 years duration, the other about 1 year.

Lab. findings.—Old lesion was negative to leishmania, but scanty bottle bacilli were found.

Culture from the 2nd gave a good growth of flagellates.

The patient had received 22 injections of antimony (no information about the salt and the dose) and the sore was cauterized twice.

Four injections of berberine sulphate were given at weekly intervals. The patient had a good recovery.

Case No 5.—Mrs. S. Hindu female.

Lesion.—A sore on the nose; was treated with mercuric ointment.

Lab. finding.—Leishmania were present. Berberine sulphate injected as before; 2 days after the 1st injection, smear negative; culture after 5 days, negative. One more injection was given and the sore was completely healed.

In case No. 2, material from the lesion on the cheek which had not yet ulcerated was cultured on N.N.N. medium and a rich growth of flagellates was obtained. 0.2 c.c. of water of condensation from 2 tubes of N.N.N. culture medium was injected into the shaved skin of an English mouse. A small nodule was produced showing scanty leishmania. The nodule was then treated with berberine sulphate solution (10 times weaker than that used for human beings). The nodule disappeared within 7 days. The mouse died later of some intercurrent disease.

Conclusions.

(1) Berberine sulphate inhibits the growth of *L. tropica* even in high dilutions like 1 in 80,000. Stibosan has no local action on the parasite. This may be the reason why antimony ointments are useless in the treatment of oriental sore.

(2) Berberine sulphate given by infiltrating the tissues around the edge of the sore, brings about complete cure in 2 or 3 weeks. The drug promises to be a specific cure for oriental sore.

REFERENCES.

Jolly, G. G. (1911). The treatment of oriental sore. *Indian Med. Gaz.*, Vol. 46, p. 466.

Karamchandani, P. V. (1927). An analysis of 337 cases of oriental sore treated by various methods. *Indian Med Gaz.*, Vol. 62, p. 558.

Sabatini, G. (1928). Diagnosis of latent malaria by administration of berberine. *Bull.-e. Atti-d-r. Accad. Med. di Roma.*, Vol. 54, p. 5-7.

Varma, R. L. (1927). Berberine sulphate in oriental sore. *Indian Med. Gaz.*, Vol. 62, p. 84.

TERMINALIA ARJUNA: ITS CHEMISTRY, PHARMACOLOGY AND THERAPEUTIC ACTION.

By R. N. CHOPRA, M.A., M.D. (Cantab.),

LIEUTENANT-COLONEL, I.M.S.,

In-charge, Indigenous Drugs Inquiry, Indian Research Fund Association,

and

SUDHAMOY GHOSH, D.SC., F.R.S.E.

(*From the Department of Pharmacology and Chemistry, Calcutta School of Tropical Medicine and Hygiene.*)

HISTORY, BOTANY, USES, ETC.

Terminalia arjuna is a large deciduous tree attaining a height of 60 to 80 feet which is common throughout the sub-Himalayan tracts of the United Provinces, and in the Deccan, Southern Bihar, Chota Nagpur, Burma and Ceylon. It is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

called "Arjun" in Hindi and Bengali and "Arjuna" in Sanskrit. The bark is ⅓ inch thick and is considered by the Sanskrit writers to be a cardiac tonic. Chakradatta, the great Hindu physician, described it as tonic, astringent and cooling, and prescribed it in heart disease and for those purposes for which astringents are generally applied. In heart disease he recommended it to be given as a decoction with milk and treacle and water or as a "ghrita" (preparation with "ghee" or melted butter) made with the decoction and powder of the bark.

The bark and preparations made from it are reputed to have a marked action on the heart even to the present day in this country. The "Kabirajes" use them for all sorts of conditions of cardiac failure and dropsy. Some of the practitioners of western medicine believe in its stimulant effect on the heart and use it as cardiac tonic. A liquid extract prepared from the bark is on the market in Calcutta. It was for this reason that we took up investigation of this drug.

CHEMICAL COMPOSITION.

A reference to the literature shows that this drug has interested many previous investigators.

Hooper (1891) mentioned that the bark yields 34 per cent. of ash consisting of almost pure $CaCO_3$; the watery extract contains as much as 23 per cent. of calcium salts and 16 per cent. of tannins. Ghoshal (1909) made a detailed chemical and pharmacological study of the bark. He found it to contain the following substances:— (1) sugar, (2) tannins, (3) a colouring matter, (4) a body of glucosidal nature and (5) carbonates of Ca and Na and traces of chlorides of alkali metals. He also found that the total tannin content amounted to 12 per cent. and the content of ash to 30 per cent.

The present investigation was started in order to determine the active principle which might be responsible for the alleged stimulant action of the drug on the heart. The bark was obtained from a reliable source and was dried in air. As the drug was said to contain glucosides, an enormous amount of careful and laborious work extending over a year was done to prove or disprove their presence. A portion of this work was done by one of us (S. G.) in the Pharmaceutical Institute of Berlin. A brief summary of the work and the procedure adopted is given in the following paragraphs:—

For a systematic examination, about 200 grms. of the powdered bark was carefully weighed out and extracted in a large glass soxhlet for several days with petroleum ether (B. P. 35°—50° C.). The yield of the petroleum ether extract, freed from the solvent was only 0.13 per cent. It contained no oily matter and when fractionally crystallised from dilute alcohol gave a minute quantity of colourless crystals which gave the reactions of a phytosterol. Nothing else could be isolated from the other fractions.

The residual powder, after extraction with petroleum ether, was extracted with ether for some days until the extraction was complete. The ethereal extract, freed from the solvent, amounted to 0.37 per cent. The substance was recrystallised from ether and some colourless crystals were isolated. The dried crystals softened at 225° and melted with decomposition at 230°C. On testing they were found to be those of an organic acid but the yield was very small. Nothing else was found in the ethereal fraction.

The residual powder, after extraction with ether, was then extracted for several days with absolute alcohol until the extraction was complete. The yield of the absolute alcoholic extract, freed from solvent, amounted to 18.12 per cent. The residue was dark red, brittle and amorphous and gave strong colour reactions for tannins.

To test for alkaloids, a portion of its solution in alcohol was treated with a few drops of acetic acid, the alcohol was removed and the residue taken up in water. The filtered aqueous solution was made slightly alkaline with Na_2CO_3 and shaken with ether and $CHCl_3$. No alkaloid could be thus traced in the alcoholic extract.

The alcoholic extract was soluble in acetone, hardly so in acetic ester and chloroform and partially soluble in amyl alcohol. A separation of the constituent tannins and colouring matters was attempted by fractional precipitation with different organic solvents but no satisfactory separation could be effected.

To determine the nature of the tannins, an aqueous solution was tested with various reagents. With $FeCl_3$ it gave a bluish-black precipitate. When poured into a solution of KOH, it gave a deep red colour. With concentrated H_2SO_4, a few drops of the solution gave a red colour. With a solution of iron alum it gave an olive colour and on adding some solid sodium acetate there was a bluish black colour. 50 c.c. of the original solution and 25 c.c. of a mixture of HCl and formalin (100 c.c. of concentrated HCl, 100 c.c. water and 150 c.c. of 40 per cent. formaldehyde) were boiled under reflux for ½ hour. A precipitate was obtained showing the presence of pyrocatechol tannins. The filtrate gave with iron alum and solid sodium acetate a bluish black colour. With bromine water the original solution gave a precipitate. A portion of the solid alcoholic extract was fused with KOH and the melt dissolved in water, filtered, acidified with dilute H_2SO_4, filtered and extracted with ether. The residue from ether was decolourised in alcoholic solution with animal charcoal and the filtrate evaporated to dryness. The residue dissolved in water gave a green colour with $FeCl_3$ which was turned red with Na_2CO_3 and violet with Na-acetate; with Br_2 water it gave no precipitate. With ammonium molybdate, it gave a reddish brown colour.

All these reactions show that the tannin in the arjun bark is mainly a *pyrocatechol tannin*.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

An attempt was also made to determine if any substance of glucosidic nature could be separated. The alcoholic extract was dissolved in hot water and treated with lead acetate and basic lead acetate. The filtrate was freed from lead by H_2S and concentrated *in vacuo* to a small bulk. The concentrated solution was filtered and evaporated to dryness in a vacuum desiccator over H_2SO_4. Nothing separated out during the evaporation over H_2SO_4. The residue was taken up in absolute alcohol and filtered. The filtrate was concentrated to a small bulk, treated with excess of chloroform and filtered. The filtrate was evaporated to dryness and the residue taken up in water. It did not reduce Fehling's solution. On hydrolysis with HCl, a white precipitate was obtained but the hydrolysed product did not reduce Fehling's solution.

As the amount of the above substance was too small for further work, a large quantity of the bark was extracted with alcohol. The alcohol was recovered and the residual powder dissolved in hot water. To avoid the presence of acetates for pharmacological trials, the aqueous solution was treated with excess of lead hydroxide (freshly precipitated and washed free from soluble salts). The filtrate was freed from Pb by H_2S and the filtered solution concentrated *in vacuo* to a small bulk. The filtered liquid was finally evaporated to dryness *in vacuo* over H_2SO_4 and treated in the above way. The residue was optically inactive. It was easily hydrolysed by HCl but the hydrolysed solution was also inactive. It did not reduce Fehling's solution either before or after hydrolysis. It was also found to be pharmacologically inactive. It was, therefore, not a glucoside but probably an ester-like compound.

The original bark, extracted with petroleum ether, ether and absolute alcohol, was next extracted 5 times with large bulks of boiling water. The aqueous filtrates were concentrated *in vacuo* to a very small bulk and precipitated by a large bulk of alcohol.

The precipitate was dried in a desiccator. When burned it gave a large amount of ash. It probably consisted of inorganic salts and salts of organic acids and was not deemed of pharmacological interest. The ash showed the presence of Al, Mg and large quantities of Ca.

The filtrate, freed from alcohol, was precipitated by lead acetate and then by basic lead acetate, the filtrate being freed from Pb and concentrated *in vacuo*. It showed the presence of only sugars. The lead acetate and basic lead acetate precipitates, which were small, were also tested separately but nothing of any interest could be detected.

100 grams of the arjun bark were then tested for glucosides by Bourquelot's process by the use of pure emulsin. No change of rotation could be observed showing the absence of glucosides (excluding tannins and colouring matters).

Estimation of tannins.—

(1) Hyde powder method: Schroder's process was used and gave 11.21 per cent. of tannins.

(2) Blood method: The hæmolytic process of Brandt was followed using fresh ox blood collected from a slaughter house. The first series of experiments gave the limit between 10 and 20 per cent. and the second series, with higher dilution, gave the final value at 12 per cent. (The method is described as approximate but comparable.)

An estimation by the Pb method was also carried out as a control to see the upper limit. The value obtained was 15 per cent. (It is generally high, since lead acetate precipitates not only the tannins but also the colouring matters and some other substances.)

The result of the chemical analysis may be summarised as follows:—

(1) About 12 per cent. of tannins, consisting mainly of pyrocatechol tannins.

(2) Some colouring matters.

(3) An organic acid with a high melting point and a phytosterol.

(4) An organic ester easily hydrolysed by mineral acids.

(5) Large amounts of calcium salts with smaller amounts of Al and Mg salts.

(6) Sugar, etc.

Pharmacological Action.—It will be seen that analysis of the bark of *terminalia arjuna* does not reveal the presence of active principles which could account for its cardiac tonic effects, which are so widely believed in in this country We carefully tested the different fractions obtained from petroleum ether, alcoholic and aqueous extracts during analysis, but found that with the exception of calcium compounds, no other constituent produced any effect on the heart or on any of the other tissues. The colouring matter was separated and tested with the same result. It will be seen, therefore, that we could not detect any pharmacologically active bodies in the bark of *Terminalia arjuna* either by chemical or biological methods.

Clinical Trials.—An alcoholic extract was prepared from the bark in our laboratory. It was carefully tested in a number of patients suffering from failure of cardiac compensation with or without dropsy. In none of the patients the drug did produce any marked effects such as are produced by drugs of the digitalis or caffein groups. The rate, frequency, force of the heart beat and the blood pressure remained appreciably unaltered. The secretion of urine was not markedly affected in these cases. Any therapeutic effects attributed to the drug may be accounted for by the high calcium content to which reference has already been made.

Summary and conclusions.

(1) An analysis of the bark of *Terminalia arjuna* does not reveal the presence of any active principles of the nature of alkaloid, glucoside or essential oil. With the exception of large amounts of calcium salts, tannins, organic acids, an organic ester and sugars no other substances could be detected.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(2) Different fractions obtained during the course of analysis from the bark including the petroleum ether, alcoholic and aqueous extracts and colouring matter were found not to show any marked physiological activity.

(3) An alcoholic extract prepared from the bark was tried in a number of patients suffering from cardiac decompensation but it did not show any appreciable effects such as are produced with the cardiac tonic drugs of the British Pharmacopœia.

REFERENCES.

Dymock, Warden and Hooper (1891). *Pharmacographica Indica*, Vol. II, p. 12.

Ghosal, L. M. (1909). Thesis on Terminalia Arjuna. *Calcutta University Studies*, No. 8.

A PRELIMINARY NOTE ON THE ACTION OF *VASOPRESSIN* AND *OXYTOCIN*.*

By J. CHRISTODOSS DAVID, M.B., B.S.,
Professor of Pharmacology,
and
C. VAREED, M.B., B.S.,
Demonstrator in Pharmacology.
(*From the Department of Pharmacology, Madras Medical College.*)

THE physiological properties of extracts of the posterior lobe of the pituitary body are well known. Briefly, they cause marked vaso-constriction and raise the blood pressure; they stimulate uterine contractions and are also diuretics. As opposed to this last observation, they markedly reduce the secretion of urine in the disease called diabetes insipidus. But chemical information regarding the physiologically active constituents of pituitary extracts is very meagre. Much controversy has raged round the question, whether these various physiological activities are due to one hormone or to more than one active principle. The general conclusion that can be drawn, from the work that has been done, is that the physiological activity of extracts of the posterior lobe of the pituitary body is due chiefly to two active principles, one tending to cause a rise of blood pressure and the other having a specific oxytocic action. According to Schafer, the principle which acts upon intestinal muscle differs from the above two and there is little doubt that it is histamine. It is probably histamine that is also responsible for the primary fall of blood pressure observed in some samples. Such samples of the extract as do not exhibit this phenomenon have little action on the intestinal muscle.

Recently O. Kamm and his associates (1928) working in the research laboratory of Parke Davis & Co. have succeeded not only in demonstrating the presence of the two important active principles but they have also been abled to separate these two and concentrate them in the form of potent solid preparations. They have shown that solutions of these separated active principles can be recombined to form a pituitary extract identical with the original from which they were prepared, thus proving that no decomposition has taken place. Both active principles are said to be basic bodies, presumably amines; practical manufacturing methods have been developed for the separation of these two hormones and these have been made available for experimental and clinical study. The oxytocic principle named *a-hypophamine* is put up in ampoules and designated *oxytocin*. The pressor principle or *b-hypophamine* has been labelled *vasopressin*. There is at present only one official standard for extracts of the posterior lobe of the pituitary gland and this is based upon the oxytocic test as described in the U. S. P. The amount of activity contained in 1 c.cm. of the official extract has been designated "10 international units." When extracts are prepared from a good grade of gland there is a fairly constant relation between the amount of oxytocic and pressor activities. So the original workers have designated the amount of pressor activity in 1 c.cm. of the official extract as "10 pressor units." Ordinary pituitrin as marketed for obstetrical purposes, therefore, contains 10 oxytocic units and 10 pressor units per c.cm. Pituitrin as marketed for surgical purposes contains 20 oxytocic units and 20 pressor units. The oxytocin put up for experimental work is said to assay 10 oxytocic activity per c.cm. but its pressor activity is only ½ a unit per c.cm. It is claimed that vasopressin contains 20 pressor units per c.cm. Its oxytocic activity is less than one unit per c.cm. From the results shown above, these authors claim that the purified active principles are bound to have a wider range of clinical use.

These active principles have been subjected to a more complete physiological study by J. H. Gaddum (1928). According to him, oxytocin has, in addition to its action on the uterus, a depressor (blood pressure) action on the fowl and, in certain circumstances, on the cat. Vasopressin, in addition to its effects on the blood pressure and on the kidney (diuresis), has a specific stimulant action on the bowel of the rabbit and a dilator action on the melanophores of the frog; the latter effect is apparently due to a different principle, so that vasopressin is not yet a physiologically pure preparation. A. W. Bourne and J. H. Burn (1928) examined the action of the separated constituents of pituitary extract on the human uterus in labour. They found that oxytocin possesses the typical stimulant action whereas vasopressin has no effect even in large doses. A given dose of oxytocin (2 units) was found to produce a large response in one patient and a small one in another. Discussing the rare cases of pituitary shock which have led to a disinclination on the part of some obstetricians to use pituitary extract, they recommend that oxytocin, having none of the vasomotor effects which are responsible for the collapse, may be confidently used. F. R. Curtis and J. W. Pickering (1928) studied the effect of these active principles on the blood. According to them, vasopressin increases the coagulability of blood both in fasting

* Messrs. Parke Davis & Co., have now changed these names to Petressin and Pitocin respectively.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

animals and in those at the height of digestion. After severe hæmorrhage, vasopressin either has no augmentary effect or delays the coagulability of blood. Oxytocin, when intravenously injected into cats increases the clotting time of blood. The injection of oxytocin after hæmorrhage produces increased coagulability. The failure of vasopressin to increase coagulability of blood after hæmorrhage decreases its hæmostatic value. The ability of oxytocin to convert hypo-coagulability into hyper-coagulability after hæmorrhage should be of considerable advantage during and after labour, when the contractile action of oxytocin on the uterus is supplemented by more rapid clotting of the blood with hardly any increase of blood pressure.

We have, at the outset, to thank Messrs. Parke Davis & Co. for supplying us with two boxes of vasopressin and oxytocin for experimental work. It was our desire to examine and see if we could substantiate the claims made for these two active principles. But as the supply was very limited our observations also had necessarily to be restricted.

Our method was to assay these two substances and compare their oxytocic and pressor values with a standard brand of pituitrin available on the market. As in our previous experiments we had invariably obtained better results with P. D. & Co.'s pituitrin, we used a potent sample of this as standard for comparison. Our experiments were done on cats and guinea-pigs. In order to observe the action of these substances in the intact animals, we used pithed cats, in which the medulla was completely destroyed by passing a convenient sharp instrument through the foramen magnum.

The blood pressure tracings were recorded as usual and the uterine graphs were obtained by Barbour's method as modified by Chopra and David (1927). Injections were given at intervals of one hour allowing sufficient time for the effects of the previous injection to pass away. The action on the isolated guinea-pig's uterus was studied by means of Dale's uterine bath.

Fig. 1 shows the effect of intravenous injections of the active principles on the blood pressure and uterine movements of a pithed cat

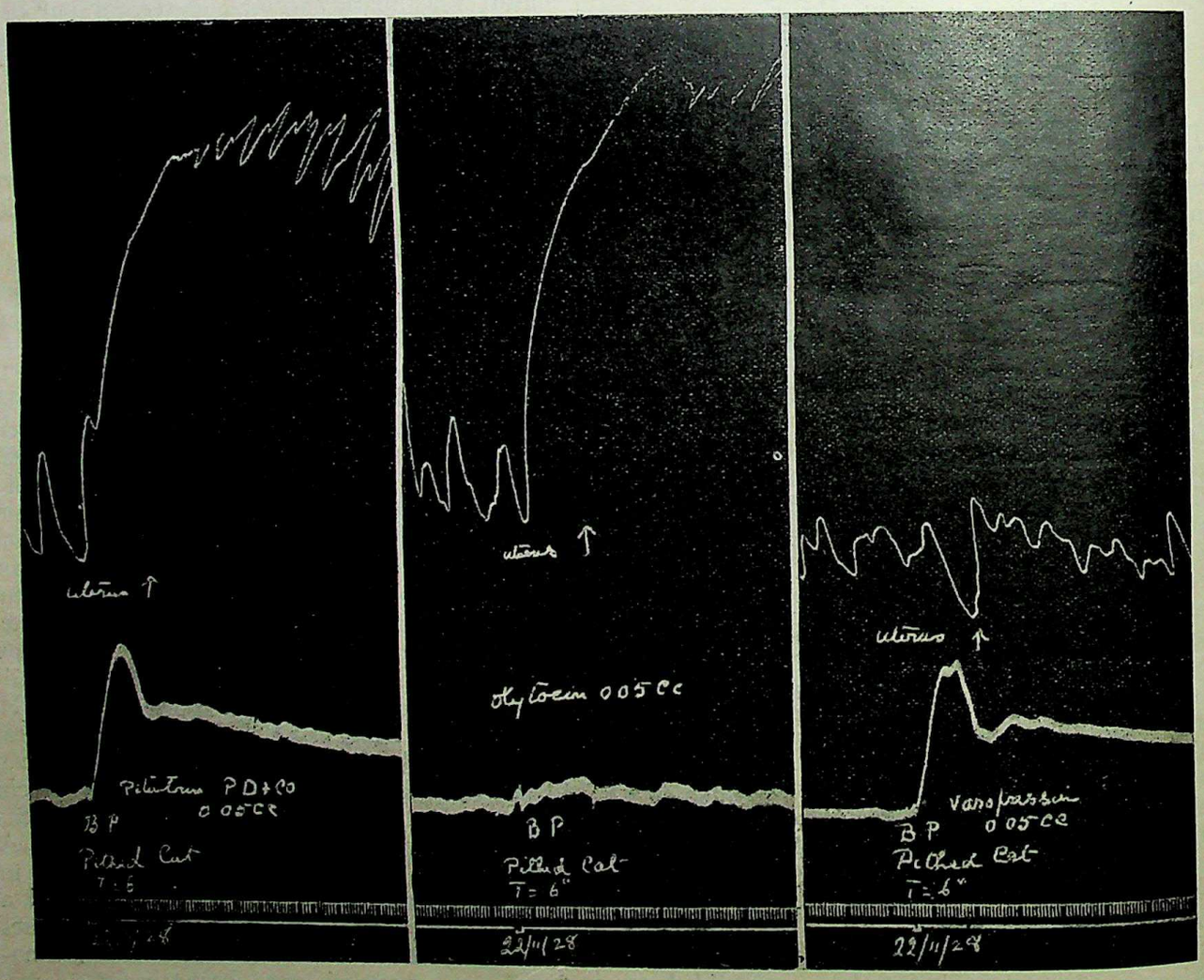


Fig. 1.

(a) (b) (c)

0.05 c.cm. doses of pituitrin and vasopressin produce the same rise of blood pressure. 0.05 c.cm. of oxytocin and the same dose of pituitrin cause the same height of uterine contraction. With

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

vasopressin, generally only a slight contraction of the uterus is noticed or there may be no effect at all. But when the uterus is unusually irritable as in pregnancy, an appreciable contraction has been noticed. The character of the contraction is not identical with what is obtained either with pituitrin or oxytocin. While with the latter there is an immediate and steadily increasing tonic contraction, in the case of vasopressin the organ relaxes between contractions exhibiting a "staircase phenomenon." After the full height of contraction is reached the uterus relaxes quickly even before the bath is washed out.

Fig. 2 shows the effect on the isolated non-pregnant uterus of the guinea-pig. 1 in 3000 dilutions (0.05 c.cm. in 150 c.cm.) of oxytocin and pituitrin generally produce the same height of contraction, while an identical dose of vasopressin either produces no effect at all or only a slight contraction or just an increase of the automatic movements.

0.25 c.cm. vasopressin, i.e., a dilution of 1 in 600 in the bath, exhibits about the same oxytocic activity as 0.01 c.cm. of pituitrin, i.e., 1 in 15,000 dilution. This indicates that the oxytocic activity of vasopressin is about 4 per cent. of that of pituitrin (Fig. 3 *a* and *b*).

Intravenous injection into a pithed cat of 0.5 cc. of oxytocin causes about the same rise of blood pressure as 0.025 c.cm. of pituitrin; showing that oxytocin has about 5 per cent. pressor activity as compared with pituitrin (Fig. 3 *c* and *d*).

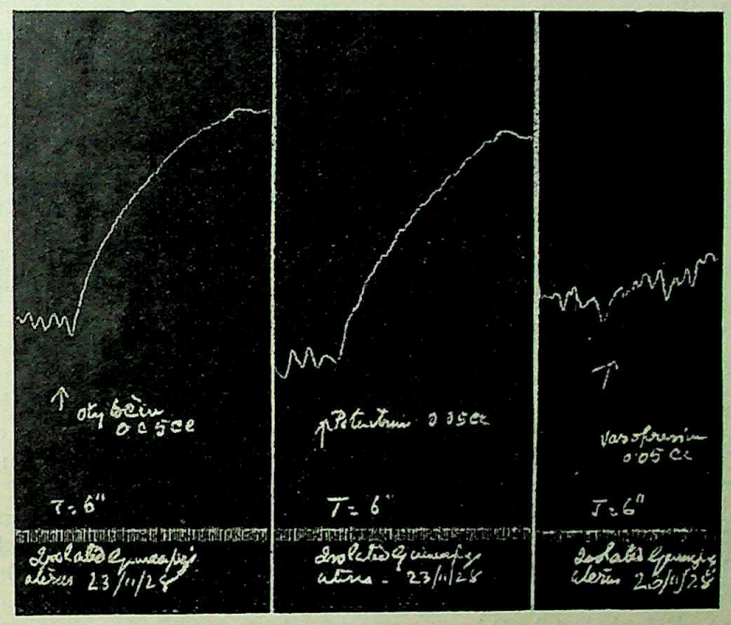


Fig. 2.

(*a*) (*b*) (*c*)

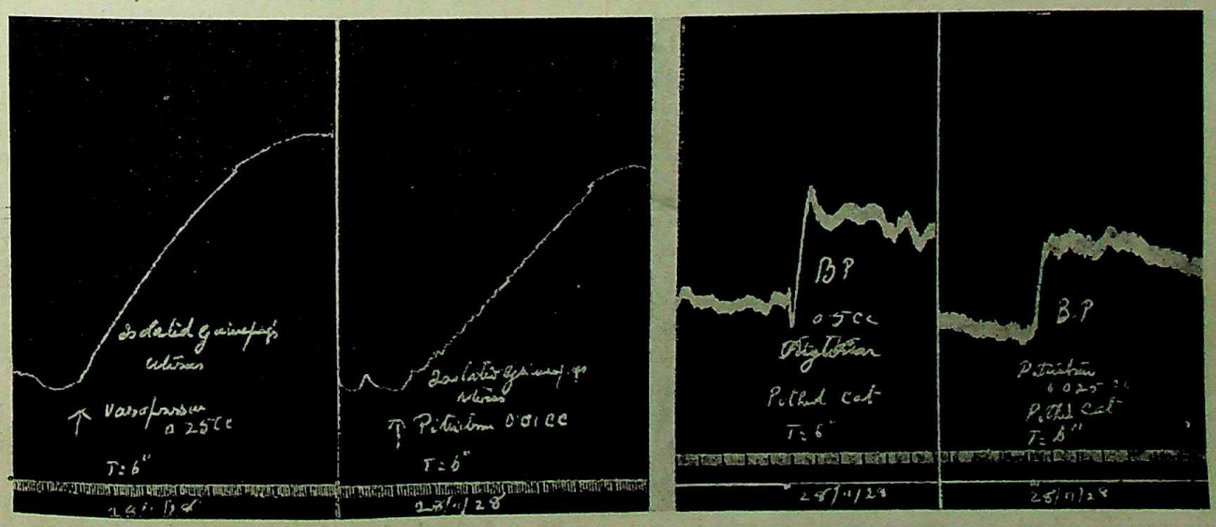


Fig. 3.

(*a*) (*b*) (*c*) (*d*)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Summary and Conclusion.

(1) The action on the blood pressure and uterine contractions of the separated active principles of the posterior lobe of the pituitary gland, designated *vasopressin* and *oxytocin* been studied.

(2) While the pressor activity of vasopressin equals that contained in the same quantity of pituitrin, its oxytocic value is only about 4 per cent.

(3) The oxytocic action of oxytocin is about the same as that of pituitrin; but its pressor activity assays only about 5 per cent.

(4) The results obtained by us, as well as by previous workers, indicate that oxytocin is a valuable substitute for the whole extract in obstetric cases especially where a rise of blood pressure is undesirable, as in eclampsia.

REFERENCES.

Chopra, R. N. and David, J. C. (1927). *Indian Journ. Med. Res.*, XV, No. 2, Oct.

Kamm, Aldrich, Grote, Rowe and Bugbee (1928). *Journ. Amer. Chem. Soc.*, Vol. I, p. 573.

Gaddum, J. H. (1928). *Journ. Physiol.*, Vol. LXV, p. 434.

Bourne, A. W. and Burn, J. H. (1928). *Lancet*, Vol. II, p. 694.

Curtis, F. R. and Pickering, J. W. (1928). *Lancet*, Vol. II, p. 695.

THE HISTORY OF TICK-BITES IN CASES OF TICK-TYPHUS IN INDIA.

By S. SUNDAR RAO.

(*From the Calcutta School of Tropical Medicine.*)

CASES of tick-typhus are sporadic in occurrence in India and are usually found distributed in hilly tracts with forests or jungle close by. The localities in which cases of typical tick-typhus have occurred are:—Sat Tal (Kumaon), Narayangunj (Dacca), Balaghat (C. P.), Bangalore (Mysore), Malakand (N. W. Frontier) and Kalimpong (Darjeeling).

The characteristics of tick-typhus as distinguished from other allied fevers have been discussed by Megaw and Rao (1928). Out of the cases discussed in that paper, eight cases of tick-typhus gave a definite history of tick-bite, while in nearly all the other cases the circumstances were such that there was a great probability of a tick-bite which was apparently not noticed by the victim. In several instances the attacks started some days after a visit to the forests or jungle close by, or under circumstances where a tick-bite was very likely. A few of the cases totally denied any history of a tick-bite, but even in such cases, one cannot be too sure that they were not bitten by ticks. Tick-bite is easily overlooked, because of the perfectly unirritating and painless manner in which the tick attacks man. That ticks can stay on man without the victim noticing them for prolonged periods is quite possible. Two instances are described in this article where the presence of attached ticks on the person of two naturalists was not observed by them for long periods. As this has happened to people with full knowledge of the habits of ticks, and who took particular precautions to avoid tick-bites, it is easily understood how likely it is that tick-bites are overlooked by lay persons.

Mr. S., a geologist, went to Assam in connection with his professional work, in December 1923, and had occasion to go into the forests in the district of Sylhet. He stayed there for a few days, and then returned to Calcutta. Seventeen days after his return to Calcutta, he reported the presence of a tick on his person on the left side of the lower abdomen. I found the tick almost completely imbedded in the skin, and only the posterior portion was seen from outside. The skin around the tick-bite had become swollen and indurated and had almost hidden the tick from view. The tick was extracted and in the region of the bite was a very large induration over an inch in diameter. No identification of the specimen was made as it was unfortunately lost.

The point of interest in this case is that this geologist, who knows what a tick is like, was not aware of the presence of the tick on his body for a period of over seventeen days, although he had a bath with soap and hot water every day.

Mr. I., an entomologist, in 1928 went into the Sukna forests in the Darjeeling Terai to collect insects. After every visit into the forests, he took care to collect all ticks on his clothing and body, and had a bath with plenty of soap, a procedure followed by the local people to get rid of ticks; Mr. I. took every care to get rid of ticks on his person, and, being an entomologist himself, knew how to do it.

Eight days after he returned to Calcutta, he felt a scab sticking to his body on the left side of the lower abdomen. On examination it was found to be a tick, which had half buried itself in the body. There was no pain at the site of the bite, and there was a hard induration, half an inch in diameter. After very hard pulling at the tick, only the body of the tick came off, the mouth-parts being left inside. The writer subsequently extracted the mouth-parts of the tick by cutting into the tissues with a Hagedorn needle and after a good deal of dissection. Even then it was found that the apical half of the right mandibular sheath and right mandible were broken and left within the tissue. The photo-micrograph reproduced here (Fig. 1) is of the mouth-parts extracted from the body of the victim. The tick has been identified as the nymphal stage of *Rhipicephalus hæmaphysaloides* Supino.

Two points of interest arise out of the present instances.

Sufferers from typical tick-typhus have frequently asserted that they have had no history of tick-bite. Such cases are easily understood in view of the present instance. Here a specialist in entomology had not observed the presence of a tick on his body for a period of over eight days, although he had made a search for them on his person and had a bath every day. When under such conditions the tick had escaped notice,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

it is conceivable how easy it is for lay persons to overlook the presence of a tick. The writer

Fig. 1.

Micro-photograph of the mouth-parts of tick extracted from Mr. I.; Nymphal stage of *Rhipicephalus hæmaphysaloides* Supino.

suggests that in cases of tick-typhus, besides enquiring into the possibility of a tick-bite, a thorough examination should be made for the presence of either a tick, or an area of induration.

The second point of interest is that while going through a forest, a very large number of ticks get to one's clothing. Yet most of them would not attack man. In one instance, over fifty specimens of ticks were collected from an individual who had been in the forests at Sukna, and these ticks were mostly of the species *Hæmaphysalis bispinosa*, whilst only one of them was *Rhipicephalus hæmaphysaloides*. While the former species do not attack man, and after some time drop off, the latter attack man.

Summary.

(1) In cases of tick-typhus the denial of a history of tick-bite by the patient cannot be relied upon. When naturalists acquainted with ticks had failed to observe the presence of ticks on their person for long periods, lay persons are easily liable to overlook the presence of ticks on their body. A thorough examination, therefore, of the patient for ticks or induration caused by tick-bites is necessary.

(2) Not all ticks, that get on to man while out in the forest attack him; some species attack, others drop off. *Rhipicephalus hæmaphysaloides* has been found to attack man in the Darjeeling Terai; while *Hæmaphysalis bispinosa*, which is far more numerous, does not do so.

The writer is indebted to Mr. M. Sharif, Assistant Superintendent, Zoological Survey of India, for his kindness in determining the specimens sent to him.

REFERENCE.

Megaw, J. W. D., and Sundar Rao, S. (1928). Tick-typhus and other sporadic fevers of the typhus group. *Indian Medical Gazette*, Vol. LXIII, p. 306.

INTRAVENOUS CALCIUM THERAPY.

By S. RAMA IYER, L.M. & S. (Mad.), V.H.A.S.,
Civil Surgeon, Thaton.

ON page 485 of the *Indian Medical Gazette* for August, 1928, an extract on the danger of intravenous calcium therapy from the *British Medical Journal* (April, 21, 1928, p. 662) is reproduced, giving an account of two experiments, one in which 50 c.cm. of 1 per cent. solution of calcium chloride and one in which 4 c.cm. of a 10 per cent. calcium chloride solution was injected intravenously. It is said that in the second experiment syncope and respiratory failure, and signs of sino-auricular heart block were caused and it was thought inadvisable to repeat the experiment following atropinization.

It is not clear from the aforesaid extract whether the calcium chloride solution used for intravenous injection was merely the solution of calcium chloride in distilled water or the solution made with physiological salt solution.

I have since 1924 been using 7.5 per cent. calcium chloride solution, prepared as described below, for intravenous injection of patients, particularly those suffering from orchitis due to gonorrhœa and also in other cases where calcium therapy is indicated. I have had no mishap. The only symptom of importance noticed was the sense of heat all over the body lasting in all for a couple of minutes or so during and after the injection. The patients were in all cases able to walk about in five minutes and some were even able to walk back to their houses varying in distance from ½ to 1½ miles. Although I have been unable to explain the cause, the injection brings about in less than 24 hours marvellous reduction in pain and size of the testicular swelling due to gonorrhœal attack particularly when the affection is recent.

The same results I have noticed in the case of epididymitis due to gonorrhœa even of long duration. In other cases where calcium therapy was indicated results by this method were not so striking as in the case of gonorrhœal orchitis or epididymitis. The injections have, however, had no effect on the urethral discharge.

A statement of cases where calcium chloride was injected intravenously from November 1926 to the middle of September 1928 is appended. Cases done before are not included since regular records of them were not kept.

My thanks are due to my Assistant, Mr. C. Basanth Rai for carefully recording the notes for me and also carrying out most of the injections according to my instructions.

The solution used for intravenous injections was prepared and used as follows:—

Calcium chloride	.. ..	ʒii.
Aqua distillata	.. ..	℥i.

Mix—and keep it as a stock solution.

Take some of this in a clean test tube and boil it; draw 2 c.cm. of it into a sterile 10 c.cm. syringe and draw into it normal saline solution freshly boiled and kept ready in another clean

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

test tube, up to 7 c.cm. Inject the solution thus diluted into the vein selected. I always see that the test tubes used for this purpose are not used for any other purpose.

Statement of Cases where Calcium Chloride Injections were given at the Civil Hospital, Thaton.

Serial No.	Patients admission No.	Age.	Sex.	Admission date.	Prominent signs and symptoms in brief.	Number of injections.	REMARKS.
1	835	30	M	20-11-26	Pain and enlargement of testicles. Duration—one month, cause—not definitely known.	1	Pain relieved but patient absconded.
2	68	24	M	30-1-27	Gonorrhœal discharge of pus from the urethra. Greatly enlarged and painful left testicle. Duration—two months.	2	Had also urethral irrigation with Condy's lotion 1 in 5000. No local treatment to the testicle. Result :—Enlargement of testicle, and pain both disappeared.
3	200	23	M	8-4-27	Had gonorrhœa 6 months ago. Pain in the left testicle with considerable enlargement of it.	1	Pain relieved but patient absconded.
4	552	15	F	8-9-27	Spastic contractions of muscles of lower limbs and inability to walk and other hysterical symptoms.	3	Relieved.
5	592	40	M	1-10-27	Severe fever and plenty of pus from the gums in spite of taking out many teeth ; lower jaw also affected.	2	No change.
6	597	19	M	4-10-27	Enlargement of the right testicle with cyst formation. Cause—unknown.	1	No change.
7	777	37	M	22-12-27	Muscular rheumatism, loss of memory; history of syphilis incipient G. P. I.	2	No change.
8	78	28	M	5-2-28	Gonorrhœal discharge of pus from urethra. Pain and enlargement of the right testicle. Duration—one month.	2	Had also urethral irrigations with Condy's lotion 1 in 5000. No local treatment to testicles. Result :—Pain disappeared, enlargement reduced ; discharge stopped.
9	176	25	M	25-3-28	Pain and enlargement of the right testicle of 7 days' duration with gonorrhœal discharge of pus from the urethra.	5	Had also urethral irrigation with Condy's lotion 1 in 5000. No local treatment to the testicle. Result :—Pain and swelling completely disappeared.
10	149	19	M.	13-3-28	History of trauma. Right testicle enlarged and painful ;	4	No change.
11	214	28	M.	19-2-28	History of gonorrhœa 10 years ago. Pain and enlargement of the right testicle, blood to W. R. ++.	8	Pain and enlargement completely disappeared. Salvarsan not injected, since blood result was awaited.
12	O P.	30	M.	19-2-28	Gonorrhœa 3 months ago ; acute pain and enlargement of the right testicle.	1	Pain and swelling reduced.
13	O.P.	35	M.	13-8-28	History of gonorrhœa, pain and enlargement of the testicles with blood ++ to W. R.	3	Enlargement and pain completely disappeared. Salvarsan not injected since blood result was awaited.
14	507	30	M.	19-6 28	Dysentery with pain in the soles of the feet.	2	No effect on pain in the soles.
15	403	26	M.	16-7-28	Continued fever of over one month, unbearable tingling pain in the feet, legs and hands and forearms.	3	Had also two injections of sodii salicylas Result :—Tingling disappeared.
16	395	30	M.	10-7-28	Gonorrhœal discharge of pus from the urethra; pain and enlargement of the left testicle.	3	Had also bladder wash with Condy's solution 1 in 5000. No local treatment to the testicle. Result :—Testicular pain and enlargement disappeared. No change in testicular pain was noticed by merely washing the bladder with Condy's fluid.

N.B.—The interval between two injections was 4 days except in a few cases where the patients did not attend the hospital regularly for the injections.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SOME SOURCES OF VITAMIN C IN INDIA.

PART I.

The Antiscorbutic Properties of Vegetable Marrow [Lagenaria Vulgaris (Serringe)] Melon Pumpkin or Mitha Kaddu (Cucurbita Moschata) and Pumpkin [Cucurbita Pepo (Linn)].

By R. C. WATS, M.D. (L'pool), D.P.H., D.T.M., CAPTAIN, I.M.S.

THE tendency of the regimental contractors to supply repeatedly the above vegetables in summer when other vegetables are scarce and costly is well known. This enquiry was undertaken to judge the vitamin C value of the above vegetables and to ascertain whether the quantities issued as rations were adequate. The scope of the experiments was limited to determining the antiscorbutic properties of the above vegetables in a diet scale such as that exemplified in the Army rations; hence guinea-pigs were fed on the basal diet and cooked vegetables and no attempt was made to test the efficacy of the raw materials.

Guinea-pigs were selected for the experiments, on account of their well-known susceptibility to scurvy. They were all given a basal diet of oatmeal, bran and 60 c.cs. of heated milk (autoclaved for 1½ hours at 115°C.). The milk used was obtained from the Government Dairy Farm and was standardised to contain 3 per cent. fat (referred to hereafter as standard milk). The respective vegetables were peeled, as in the regimental cook-houses and boiled for 20 minutes in "salted" water before administration to animals. To determine to what extent the presence of "rich" milk containing 5 to 7 per cent. of milk fats (referred to below as rich milk) protected the animals from developing scurvy, one set of animals were given the basal diet consisting of oatmeal and 60 c.cs. of autoclaved "rich" milk.

The eighteen experimental guinea-pigs of weights varying between 571 and 815 grammes were divided into the following groups:—

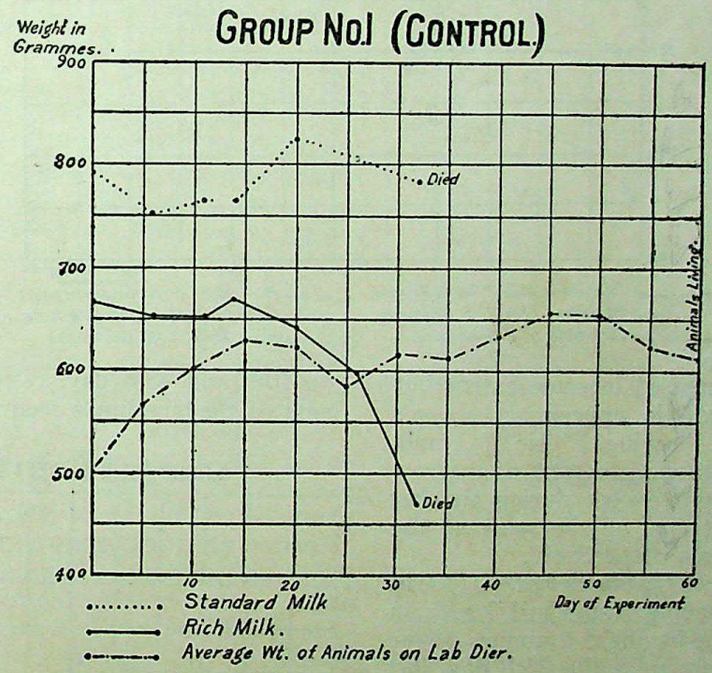
Group No. I, Control.—(*a*) Two animals, one having the basal diet containing 60 c.cs. of "standard" milk and the other with the same amount of "rich" milk. (*b*) Two animals on ordinary laboratory diet consisting of lucern, bran, etc.

Group No. II, Vegetable Marrow Series.—(*i*) Three animals on basal diet containing 60 c.cs. heated "standard" milk with 5, 10 and 15 grammes of the cooked vegetable respectively.

(*ii*) Three animals on basal diet containing 60 c.cs. heated "rich" milk with 5, 10 and 15 grammes of cooked vegetable respectively.

Group No. III, Sweet Kaddu Series.—Same as Group No. II except for the substitution of 5 and 10 grammes of cooked sweet *kaddu*.

Group No. IV, Pumpkin Series.—Same as above except for the substitution of 5 and 10 grammes of cooked pumpkin.



In the case of Control animals (Group No. 1(*a*), the one on "rich" milk steadily lost weight and died on the 33rd day of the experiment,—the other lost weight until the 14th day and then began to increase in weight but died all the same on the 39th day. Both animals showed signs of scurvy at autopsy, i.e., hæmorrhages in various parts (intestines, bladder, kidney, costochondral junctions, etc.).

The two animals of Group I (*b*) increased and decreased steadily in weight as seen in the graph.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Group No. II, Vegetable Marrow Series.—(*i*) Out of the three animals having "standard" milk in the basal diet, the one having 5 grammes of the vegetable kept losing weight until the 20th day, then gained some for a few days but lost again and died on the 43rd day. The animal having 10 grammes of the vegetable gradually lost weight and died on the 34th day. Both animals had the usual signs of scurvy at autopsy. The animal having 15 grammes of marrow in the diet steadily increased until the 30th day and then decreased to some extent but was living at the end of the experiment.

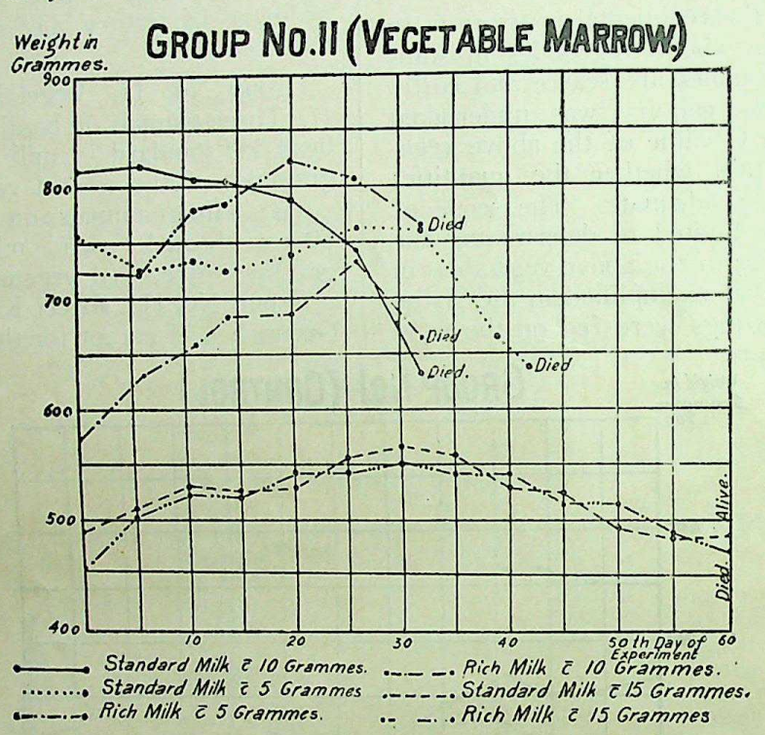
(*ii*) The animals having "rich" milk basal diet with 5, 10 and 15 grammes of marrow gradually put on weight except during the last one or two weeks but died all the same on the 36th, 39th and 66th day, respectively.

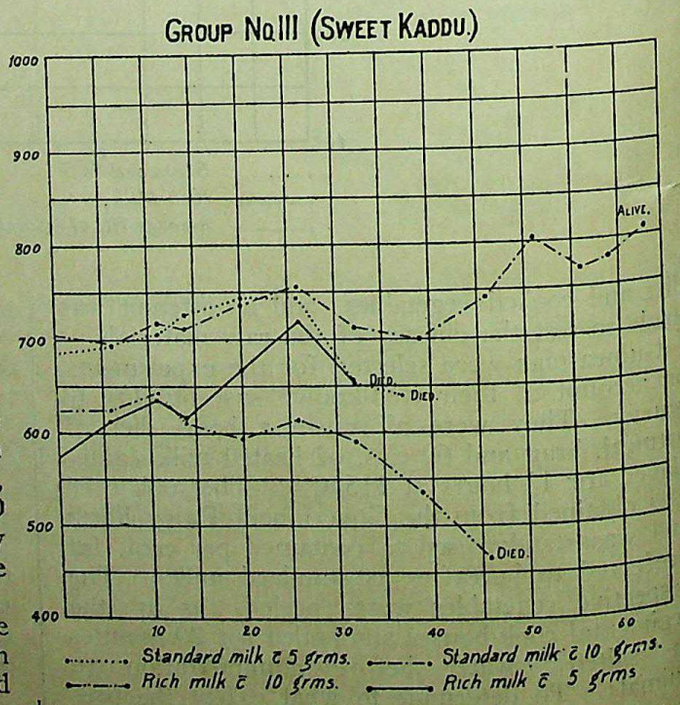
Group No. III, Sweet *Kaddu* Series.—(*i*) Out of the two animals having "standard" milk in their basal diet, the one having 5 grammes of the vegetable put on weight until the 26th day, lost weight during the following week and died. The one having 10 grammes of the vegetable went on gaining weight until the 68th day and showed no apparent signs of scurvy.

(*ii*) Of the two animals which were given basal diet supplemented by "rich" milk, one having 5 grammes of the vegetable increased in weight steadily except during the last few days, but died on the 33rd day. The one having 10 grammes of the vegetable lost weight gradually with some intervening rises in the weight curve and died on the 51st day.

Group No. IV, Pumpkin Series.—(*i*) The animal having 5 grammes of the vegetable with "standard" milk basal diet cannot be compared with the other as the former proved to be pregnant, hence the rapid increase in weight curve. It delivered on the 33rd day two still-born young ones, and went on losing weight until its death on the 49th day. The other animal having 10 grammes of pumpkin went on gaining weight until the 68th day when the experiment was terminated.

(*ii*) The animal on "rich" milk diet having 5 grammes of the vegetable died on the 54th* day and the one having 10 grammes on the 45th day. The animals on rich milk diet with 10 grammes of pumpkin and 15 grammes of vegetable marrow showed the following symptoms on the 40th and 45th day, respectively. The movement of the hind limbs seemed to be painful, hence



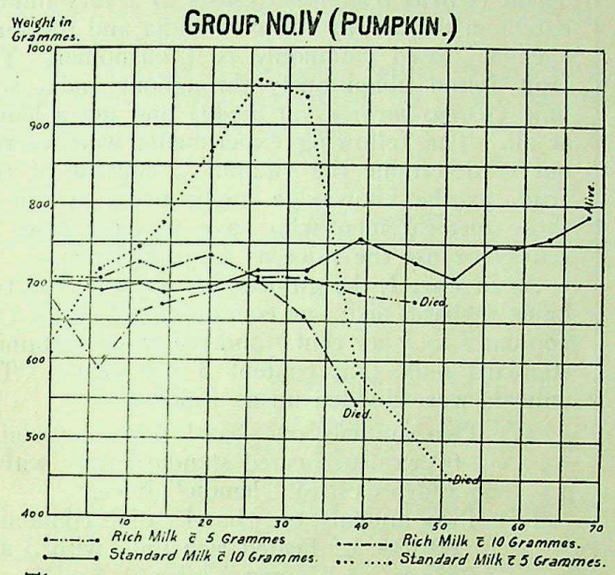


*The figures given in the text do not in some instances correspond with the graphs in the charts.—ED., *I. M. G.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the reluctance of the animal to move about when released from the cage. On pressure the muscles of the hind legs seemed to be tender and to some extent insensitive to pinpricks. There seemed to be some difficulty in defæcation, the stool pellets getting accumulated in the anus but not being expelled for a long time.



The results of all post-mortem examinations are recorded in the details of the experiments given at the end of the paper, which prove that death in all cases, except one, was due to scurvy (see under "Summary").

SUMMARY.

I. The antiscorbutic values of the vegetables under experiment and their practical application.

The results of the group of experiments, in which the basal diet was supplemented by "standard" milk (3 per cent. milk fat), go to prove that 15 grammes of vegetable marrow and 10 grammes of pumpkin and melon pumpkin are capable of protecting guinea-pigs from scurvy.

Veddar(1) discussing the physiological action of the vitamins mentions that while a human being requires an ounce of lime juice, the guinea-pig requires about one-tenth (3 c.cs.) in its daily diet to prevent scurvy. If the same ratio was to hold good in the case of other materials containing vitamin C then 100 grammes or $3\frac{1}{3}$ oz. nett of pumpkin or *mitha kaddu* (melon pumpkin) will be required per day per man. As a result of several weighings it was found, during the course of these experiments, that 50 per cent. of these vegetables were thrown away during the process of peeling by the cooks. This observation was made in a cook-house for British troops by weighing the vegetables before and after they were ready for cooking. Keeping this in mind, it can safely be concluded that at least 6 ozs. of pumpkin or melon pumpkin (when no other source of vitamin C is available) will be required daily to act as an antiscorbutic for human beings. Vegetable marrow is poor in antiscorbutic properties and the large amount (over 5 ozs. nett) required will be too bulky for any one to consume with relish. At present the ration scale for British troops (2) allows an issue of 8 ozs. of vegetables (other than potatoes and onions), 6 ozs. of onions and 10 ozs. of potatoes. If we take the combined value of these components (potatoes and onions alone being ample for the purpose), it will be evident that the amount of vitamin C available will be liberal even if the "vegetable" issued is vegetable marrow.

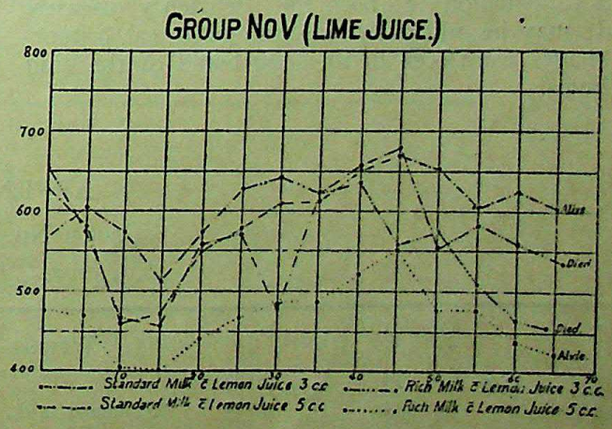
II. The effect of "rich" milk (fat over 5 per cent.) in the basal diet used in the above experiments.

In the following description S.M.D. stands for basal diet with "standard" milk and R.M.D. for the one with "rich" milk.

1. Among the control animals the one on R.M.D. died a week earlier than the other (S.M.D.).

2. Among the animals having 5 grammes of *vegetable marrow* the one on R.M.D. died a week earlier than the other, while out of those having 10 grammes of this vegetable the reverse held good, viz., the one on S.M.D. died 5 days earlier than the one on R.M.D. The animal on R.M.D. and 15 grammes of the vegetable showed symptoms of (?) neuritis in the hind legs (see above) while the other on S.M.D. was normal. The hæmorrhages seen post-mortem in the animals were absent in the former and no other signs of scurvy were seen.

3. In the *melon pumpkin* group both animals on R.M.D. having 5 and 10 grammes of the vegetable died earlier than the others (S.M.D.), the difference being 4 and 44 days, respectively. The animals on S.M.D. and 10 grammes of this vegetable were putting on weight and showing



no signs of scurvy on termination of the experiment on the 68th day.

4. Among the animals of Group IV (pumpkin), only those having 10 grammes of the vegetable could be compared, as the one on S.M.D. and 5 grammes of this vegetable was found to be pregnant and died 5 days earlier than the other (R.M.D.). Out of the two having 10 grammes of the vegetable, the one on R.M.D. died on the 45th day, while the other (S.M.D.) gained in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

weight and showed no signs of scurvy on termination of the experiments on the 68th day. The former animal (on R.M.D.) showed the abnormalities referred to under paragraph 3 above but signs of scurvy were well marked post-mortem.

No definite inference can be drawn as to why the animals fed on "rich" milk diet died more rapidly than those on "standard" milk. This much is evident that the "rich" diet did not prevent the onset of scurvy though it did prevent the falling of the body weight in some cases. McCarrison(3), discussing the factors influencing the onset of deficiency disease, lays stress on the balance of proteins, carbohydrates and fats; it may be the disproportionate richness of milk fats in the present case which expedited the onset of scurvy and death. Hopkins(4), discussing polyneuritis in birds, states that in the absence of vitamin B, vitamin A may exert an actually harmful influence—the same may probably be true in case of the deficiency of vitamin C. It was presumed before the beginning of these experiments that the rich milk containing, as it does, an extra amount of vitamin A and milk fats would postpone—if not prevent,—the onset of scurvy but the contrary happened and vitamin A did not act as a complementary to or co-operative with vitamin C. It may be stated here that no signs of gastro-intestinal disturbance, except temporary anorexia in some cases, were noted in any of the guinea-pigs.

The animals on rich milk diet with 10 and 15 grammes of vegetable marrow and pumpkin, respectively, had nervous symptoms in the hind legs. The absence of any signs or symptoms of scurvy and the presence of (?) neuritis seen in the animal having 15 grammes of marrow seems to point more towards beri-beri than scurvy, while the animal on 10 grammes of pumpkin showed a combination of both the deficiency diseases. It may be added that no sub-periosteal hæmorrhages were seen in the long bones of the hind limbs.

PART II.

Whatever view may be held as to the exact causation of scurvy, all experience goes to show that the administration of fresh lemon or lime juice is a therapeutical measure of the first order —the former supposed to be four times as potent as the latter. It is not commonly known that lemon (*Citrus lemonum*) exists to a very limited extent in the North West of India and the term "lemon" used commonly is a misnomer. The fruit found ubiquitously throughout India is a lime (*Citrus medica* var *acida*) and not a lemon at all. The following experiments were carried out to determine the vitamin C content of this fruit, as the knowledge might prove useful to those medical men who have to treat cases of scurvy or use the juice as a prophylactic.

As in Part I, the guinea-pigs were put on two kinds of basal diet, one containing rich milk (fat content 5 to 7 per cent.) and the other containing standard milk (fat content 3 per cent.). The animals were divided up as follows:—

(*i*) Two animals on basal diet containing 60 c.cs. of heated standard milk with 3 and 5 c.cs. of "lemon" juice.

(*ii*) Two animals on basal diet containing 60 c.cs. of heated rich milk with 3 and 5 c.cs. of "lemon" juice.

Both the animals on standard and rich milk basal diet supplemented by 3 c.cs. of "lemon" juice died of scurvy on or about the 64th day. The loss of weight in the one having rich milk diet was much more marked than the other.

Both the animals on 5 c.cs. of lemon juice survived and showed no signs of scurvy.

In view of the above it is apparent that 5 c.cs. of the juice extracted from the common "lemon" are capable of protecting a guinea-pig from scurvy, hence a human being would require about 50 c.cs. (if no other source of vitamin C was available) (*see* Part I, Summary I for calculation of the amount).

APPENDIX.

GROUP No. I CONTROL.

(*a*) *Basal diet only.*

Date.	Diet.	Weight of animals.		Remarks.
		Standard milk. (1)	Rich milk. (2)	
27-3-1928 ..	Oatmeal, bran and water *ad lib* with 60 c.cs. of heated milk.	792 grammes	663 grammes	
2-4-1928 ..		754 "	653 "	
7-4-1928 ..		767 "	653 "	
10-4-1928 ..		766 "	671 "	
16-4-1928 ..		823 "	641 "	
22-4-1928 ..		808 "	599 "	
28-4-1928 ..		784 "	474 "	(2) Found dead on 29-4-28 morning.
29-4-1928 ..		....	....	
5-5-1928 ..		....	....	(1) Found dead in the morning.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Post-mortem examination:—

1. Fed with standard milk.—Subcutaneous hæmorrhages over the abdominal wall, subserous intestinal hæmorrhages, suprarenal glands enlarged and hæmorrhagic. Costochondral junctions enlarged and hæmorrhagic.

2. Fed with rich milk.—Showed well marked intestinal subserous hæmorrhages, also in the bladder. Costochondral junctions were enlarged and hæmorrhagic.

(*b*) The average weight curve of the two animals on normal laboratory diet is shown on the Graph No. I (Control).

Post-mortem examination:—

I. Standard milk.

1. Fed with 5 grammes of vegetable marrow:—Petechial hæmorrhages on the abdomen and thorax were present. Subserous, intestinal, submucous and bladder hæmorrhages were present. Suprarenals were enlarged and hæmorrhagic.

2. Petechial hæmorrhages were not present on the abdomen and thorax otherwise same as above (1). In addition costochondral junctions were enlarged and hæmorrhagic.

GROUP No. II.

Basal diet with 5, 10 *and* 15 *grammes of vegetable marrow.*

Date.	Diet.	Weight of Animals.						Remarks
		Standard milk.			Rich milk.			
		(1) 5 grms. of vegetable marrow.	(2) 10 grms. of vegetable marrow.	(3) 15 grms. of vegetable marrow.	(4) 5 grms. of vegetable marrow.	(5) 10 grms. of vegetable marrow.	(6) 15 grms. of vegetable marrow.	
27-3-28	Oatmeal, bran and water *ad lib* with 60 c.cs. of heated milk.	753 grms.	815 grms.	490 grms.	723 grms.	575 grms.	452 grms.	(2) & (4) found dead on 1-5-1928. (5) found dead on 5-5-1928. (1) found dead on 9-5-1928. (6) died on 24-5-1928.
2-4-28		729 ,,	826 ,,	510 ,,	726 ,,	631 ,,	506 ,,	
7-4-28		733 ,,	808 ,,	531 ,,	780 ,,	660 ,,	527 ,,	
10-4-28		724 ,,	805 ,,	528 ,,	783 ,,	683 ,,	522 ,,	
16-4-28		740 ,,	790 ,,	530 ,,	821 ,,	688 ,,	547 ,,	
22-4-28		762 ,,	748 ,,	556 ,,	808 ,,	733 ,,	543 ,,	
28-4-28		760 ,,	634 ,,	568 ,,	764 ,,	665 ,,	551 ,,	
3-5-28		..	..	560 ,,	..	..	543 ,,	
5-5-28		665 ,,	..	..	..	..	..	
8-5-28		640 ,,	..	530 ,,	..	..	541 ,,	
14-5-28		..	..	526 ,,	..	..	515 ,,	
14-5-28		..	..	495 ,,	..	..	514 ,,	
19-5-28		..	..	485 ,,	..	..	484 ,,	
24-5-28		..	..	488 ,,	..	..	470 ,,	
29-5-28		..	..	486 ,, (alive)	..	..	456 ,,	

GROUP No. III.

Basal diet with 5 *and* 10 *grammes of Sweet Kaddu or Melon pumpkin* (*Cucurbita Moschata*).

Date.	Diet.	Weight of Animals.				Remarks.
		Standard milk.		Rich milk.		
		(1) 5 grms. of Sweet Kaddu.	(2) 10 grms. of Sweet Kaddu.	(3) 5 grms. of Sweet Kaddu.	(4) 10 grms. of Sweet Kaddu.	
27-3-28	Oatmeal, bran and water *ad lib* with 60 c.cs. of heated milk.	708 grms.	687 grms.	571 grms.	621 grms.	(3) found dead on 28-4-1928. (1) found dead on 2-5-1928. (4) died on 17-5-1928.
2-4-28		698 ,,	695 ,,	611 ,,	624 ,,	
7-4-28		708 ,,	718 ,,	638 ,,	641 ,,	
10-4-28		727 ,,	710 ,,	618 ,,	611 ,,	
16-4-28		743 ,,	739 ,,	668 ,,	594 ,,	
22-4-28		745 ,,	754 ,,	720 ,,	616 ,,	
28-4-28		651 ,,	713 ,,	658 ,,	590 ,,	
2-5-28		640 ,,	..	..	..	
5-5-28		..	700 ,,	..	538 ,,	
12-5-28		..	743 ,,	..	463 ,,	
17-5-28		..	803 ,,	..	450 ,,	
21-5-28		..	768 ,,	..	..	
24-5-28		..	780 ,,	..	..	
28-5-28		..	808 ,,	..	..	
2-6-28		..	768 ,, (alive)	..	..	

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

3. Fed with 15 grammes of marrow.—Living when experiment was terminated. No external signs of scurvy.

II. Rich Milk.

4. Fed with 5 grammes of vegetable marrow. Same as standard milk (1), *see above*. Costochondral junctions were also enlarged and hæmorrhagic.

5. Fed with 10 grammes of vegetable marrow. Same as standard milk (1), *see above*.

6. Fed with 15 grammes of vegetable marrow. No hæmorrhages anywhere, teeth firm. Nothing abnormal seen microscopically.

Post-mortem examination:—

I. Standard Milk.

1. Fed with 5 grammes of sweet kaddu. Petechial hæmorrhages on abdomen and thorax, gums swollen and spongy. Subserous hæmorrhages present on liver and intestines. Costochondral junctions swollen and hæmorrhagic. Suprarenals enlarged and congested.

II. Rich Milk.

3. Fed with 5 grammes of sweet kaddu. Same as (1) except that the costochondral junctions were not swollen or hæmorrhagic.

4. Fed with 10 grammes of sweet kaddu. Same as (1) except no petechial hæmorrhages on abdomen or thorax, no sponginess of gums. Suprarenals enlarged and congested.

Post-mortem examination:—

I. Standard Milk.

1. Fed on 5 grammes of pumpkin. No petecial hæmorrhages. Subserous intestinal hæmorrhages present. Suprarenals enlarged, congested and hæmorrhagic. Costochondral junctions swollen and hæmorrhagic. Gums spongy and swollen.

II. Rich Milk.

3. Fed with 5 grammes of pumpkin. Same as above (1) except that congestion of liver and petechial hæmorrhages were found. Few hæmorrhages of intestines, no sponginess of gums noted.

4. Fed with 10 grammes of pumpkin. Same as above (1) except petechial hæmorrhages present, suprarenals enlarged and congested. Gums not swollen.

GROUP No. IV.

Basal diet with 5 and 10 grammes of Pumpkin.

Date.	Diet.	Weight of Animals.				Remarks.
		Standard milk.		Rich milk.		
		(1) 5 grms. of Pumpkin.	(2) 10 grms. of Pumpkin.	(3) 5 grms. of Pumpkin.	(4) 10 grms. of Pumpkin.	
27-3-28	Oatmeal, bran and water *ad lib* with 60 c.cs. of heated milk.	628 grms.	700 grms.	701 grms.	680 grms.	(4) died on 10-5-1928. (1) died on 15-5-1928. (3) died on 20-5-1928.
2-4-28		712 „	690 „	704 „	590 „	
7-4-28		743 „	698 „	723 „	660 „	
10-4-28		778 „	688 „	714 „	670 „	
16-4-28		865 „	698 „	732 „	689 „	
22-4-28		958 „	716 „	705 „	701 „	
28-4-28		938 „	714 „	705 „	655 „	
5-5-28		583 „	753 „	688 „	543 „	
12-5-28		450 „	728 „	678 „	..	
15-5-28		..	..	..	..	
17-5-28		..	708 „	608 „	..	
21-5-28		..	748 „	..	..	
24-5-28		..	746 „	..	..	
28-5-28		..	758 „	..	..	
2-6-28		..	788 „ (alive)	..	..	

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PART II.

Basal diet with 3 and 5 c.cs. of lemon juice.

Date.	Diet.	Weight of Animals.				Remarks.
		Standard milk.		Rich milk.		
		(1) 3 c.cs. of lemon juice.	(2) 5 c.cs. of lemon juice.	(3) 3 c.cs. of lemon juice.	(4) 5 c.cs. of lemon juice.	
9-7-28	Oatmeal, bran and water *ad lib* with 60 c.cs. of heated milk.	561 grms.	632 grms.	652 grms.	473 grms.	
14-7-28		605 „	580 „	574 „	470 „	
19-7-28		557 „	460 „	468 „	404 „	
24-7-28		520 „	470 „	453 „	386 „	
29-7-28		571 „	551 „	556 „	440 „	
3-8-28		628 „	578 „	574 „	463 „	
8-8-28		643 „	610 „	479 „	482 „	
13-8-28		625 „	617 „	625 „	489 „	
18-8-28		654 „	653 „	639 „	520 „	
23-8-28		680 „	670 „	558 „	550 „	
29-8-28		551 „	652 „	577 „	477 „	
3-9-28		581 „	603 „	510 „	477 „	
8-9-28		560 „	623 „	462 „	438 „	
10-9-28		538 „	602 „	453 „	424 „	
12-9-28		..	..	died	..	
14-9-28		died	alive, no signs of scurvy.	..	alive, no signs of scurvy.	

(1) The teeth were so loose that the upper incisors had dropped out. Hæmorrhages, subserous and intestinal, were present. Suprarenals were enlarged, congested and hæmorrhagic.

(3) Same as above except that teeth were not affected. Few subserous hæmorrhages. No other signs of scurvy.

REFERENCES.

(1) Byam and Archibald's *Practice of Medicine in the Tropics*, Vol. III, p. 2037, para iii.
(2) *Scale of rations and supplies issued by the I.A.S.C.*, Section II, Table A, p. 2.
(3) McCarrison, *Studies in Deficiency Disease*, p. 42.
(4) Hopkins. *Proceedings of the Royal Society of Medicine*, 13, 1, 1923.

A Mirror of Hospital Practice.

TWO CASES OF SURGICAL INTEREST.

By MOHD. AJMAL HUSAIN, M.B., B.S.,
Captain, P.C.M.S.,
Medical Officer Canal Dispensary, Rasul. District Gujrat. Punjab.

MADURA FOOT.

AHMAD, aged 35 years, resident District Gujrat, Punjab, admitted with enormous swelling of the right foot running up to the ankle joint riddled with numerous sinuses discharging profuse offensive pus containing typical mycetoma granules. Duration 12 years, scraped at various hospitals with no lasting improvement. General condition at the time of admission to the hospital markedly toxæmic owing to prolonged septic absorption with enlargement of inguinal glands. Patient much emaciated, anæmic and running hectic temperature.

Bromide mixture and hypodermic injection of morphia with atropine were given an hour or so before operation to safeguard against surgical shock.

Operation.—Leg amputated at the junction of the middle with the lower third. Patient had good sleep following anæsthesia.

Progress.—Gradual improvement in the general condition of the patient. Temperature came down to normal and the lymphatic glands subsided in a few days time. Wound healed up by first intention.

Observations:

1. Chronicity of the disease.
2. Futility of half-hearted measures once the diagnosis is established, yellow or black mycetoma granules being characteristic.
3. Value of morphia and atropine hypodermically in bad cases likely to suffer from symptoms of surgical shock following general anæsthesia.

FIBRO-SARCOMA OF THE THIGH.

Budha, 20 years, resident Gujrat, Punjab, admitted with a large swelling in the upper and outer part of the right thigh. Duration 6 months. Swelling troublesome on account of its large size and weight causing dragging pain.

On examination it was found to be a tense swelling, fairly movable on the deeper structures, skin adherent to the growth underneath and greatly stretched showing white lines like those seen on the skin over the gravid uterus, blue dilated veins seen running over it in all directions. On palpation, distinct fluctuations were felt deeply with no other signs of inflammation. This was explored twice, first with an ordinary 10 c.cm. Record syringe and later with an hydrocele-tapping trocar and cannula; each time only a few cubic centimetres of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

blood-stained fluid were withdrawn with no marked reduction in the size of the swelling.

Operation.—Under chloroform, incision about six inches long over the most prominent part of the swelling; noticed a growth in the substance of the vastus lateralis, the fibres of which were greatly thinned out and were spread over it. In spite of careful dissection the growth could not be removed entire, the capsule being very adherent to the skin. It burst and discharged about 10 to 12 c.cms. of thick blood-stained fluid. This, however, reduced the size of the swelling by only about a third. The rest of the growth was dissected out with some difficulty by separating the fibres of the vastus lateralis. Remnants of the capsule which was very indefinite, were removed carefully. All bleeding points were secured. These were fairly numerous on account of the vascular nature of the growth. The wound was closed by ordinary interrupted sutures. The weight of the growth removed was approximately 5 to 6 lbs. On section, it had the naked-eye appearance of a fibroma with numerous blood vessels in its substance. The capsule was found to be very indistinct and indefinite suggesting malignancy. After about a week the lower half of the wound healed up by first intention while the stitches in the upper part were found markedly stretched. The latter when removed caused considerable gaping of the margins of the wound, about 5 to 6 ozs. of the same blood-stained fluid escaped and the wound was found to be full of sloughs. These sloughs were thoroughly scraped away and the area touched with pure carbolic acid. The wound became healthy gradually and healed up by granulation.

The patient was discharged cured of this trouble, but was readmitted two weeks later complaining of cough, breathlessness and fever. On examination the whole of the left chest was found to be dull on percussion, with loss of breath sounds. The heart was pushed to the right side as far out as the right nipple line.

On exploring the pleural cavity blood-stained fluid similar to that found in the tumour was drawn. On aspirating 13 ounces of this fluid were withdrawn by Potain's aspirator.

Nature of the Fluid.—Thick, blood-stained, with a specific gravity of 1015, containing a large amount of albumin.

All the chest symptoms gradually improved and the patient was about to be discharged in a few days time when he developed signs of accumulation of fluid on the right side. He was advised to get himself aspirated again but he refused and left the hospital.

Points of Interest:

1. Large size of the growth.
2. Presence of large amount of fluid, produced probably by the cystic degeneration of the growth.
3. Its rapid increase in size.
4. Its association with fluid in the pleural cavity.

Conclusions.—Vascularity of the growth, its rapid increase in size and tendency to recurrence are very suggestive of malignancy while the accumulation of fluid in the pleural cavities suggests the presence of secondary growths in the lungs.

MUSCULO-SPIRAL NERVE PARALYSIS FOLLOWING AN INTRAMUSCULAR INJECTION OF QUININE.

By T. SESHACHALAM, M.R.C.S., L.R.C.P.,
Assistant Surgeon, Victoria Hospital, Bangalore.

H. S. V., a boy aged 16 years, was suffering from malaria for which he received three intramuscular injections of quinine elsewhere. The last injection was given in the right arm on 10th May, 1927. The injection was very painful, the arm was swollen during the afternoon and the wrist was powerless and dropped. The case was seen by me on the 20th July, 1927, (70 days after the lesion). The boy refused prolonged treatment at the time, but came back on the 12th September, 1927, (122 days after the lesion). In addition to the wristdrop there was wasting of all the extensor muscles of the forearm, the supinator longus being particularly atrophied. There was no sensory change.

The wrist was fixed in a hyper-extended position in a Robert Jones' cock-up splint. Electric massage to the muscles of the forearm and passive movements to the fingers and wrist were given every day, after removing the splint and supporting the wrist. The wrist was not allowed to hang unsupported during these movements. In about 20 days' time slight power appeared in the muscles. Active movements were encouraged every day in addition to passive movements. About the middle of October the patient was able to hold the wrist with the hand in a plane with the forearm. He was sent home with advice to carry on active movements.

The patient was seen on 20th December, when the following notes were entered:—

"Full voluntary flexion and extension are possible. The supinator longus has developed to its normal size. There is no wristdrop. Splint removed." A letter received from the patient on the 1st February, 1928, says that he is able to use his right hand as well as he did before the injection.

Intramuscular injection of any sort is very safely done in the upper and outer quadrant in the gluteal region or in the substance of the deltoid and not below the level of its insertion. In the case reported above, the injection had evidently been made in the middle of the arm and the quinine solution must have been put around the nerve.

In cases of musculo-spiral paralysis the wrist is fixed in a hyper-extended position in order to relax all the paralysed muscles so that when they regain their power they may act without the mechanical disadvantage of a lengthened muscle.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

My thanks are due to Dr. C. Krishnaswami Rao, Physician of the Victoria Hospital, who saw the patient in his out-patient department and referred the case to me.

A CASE OF HYSTERIA (NARCOLEPSY?)

By M. L. KAMATH, B.A., M.D.,

and

P. KUTUMBIAH, B.A., M.B., B.S.

ON 27th January, 1928, Seethaiya, a Hindu male, 12 years, was admitted complaining of reeling sensation and falling. He was brought from the out-patient department on a stretcher.

Examination.—Abrasions 2 inches by ½ inch on frontal and left parietal eminences. Scars due to falling, around both knees, lower half of right shin and middle third of left shin. Has a vacant stare and laughs inordinately. General intelligence that of a child of 8 years. Not dirty. Spare build. Incisors good. Skin and eyebrows normal, circumference of head 19¾ inches. Left ear to occiput 4½ inches, right ear to occiput 3¾. Both ears to sinciput 5¾ inches. Palate normal. Does not get up or change from side to side in the bed. Was bodily lifted from the bed and put on his feet thrice on the day of admission and twice on the 2nd day and he fell on all five occasions. No sensory or motor disturbances; other systems and temperature normal. Skiagram of the head did not show anything abnormal.

History.—No history or manifestations of syphilis. A somnambulist from the age of 7. From the age of 9 has been stealing food from other houses when he could. Reeling from the age of 11. During the last three months has been unable to walk, falling on his face or sides if he be put on his feet.

After the fall of the second day he was told about the good effects of hospital treatment, was persuaded to walk and promised lozenges if he did so. After that he was again put on his feet and slowly walked, later ran, and was discharged alright on 6th February, 1928.

AN UNDESCENDED TESTICLE IN AN UNUSUAL POSITION.

By FRANCIS CHRISTIAN, M.R.C.S., L.R.C.P., L.M.

WHEN I was going through my case book the other day I came across an interesting case which I believe will be worth recording. On the 21st July, 1924, I had an emergency call in the middle of the night and on going to the hospital found on the table in the waiting room near the operation theatre a boy about 14 years old badly gored by a buffalo, some 18 hours before his arrival at the hospital, with about 16 feet of the small intestine outside the abdominal cavity tugged together and tied up with dirty rags. His face and general appearance showed that the boy was suffering from great shock. I at once adopted the necessary means to counteract it. Fortunately for the boy the protruded viscera had suffered comparatively little damage and I had only to resect about 4 inches of the gut and do an end-to-end anastomosis, the rest of the gut being uninjured and viable, though it had been roughly handled by his friends who brought him to the hospital and was covered with dirty materials for many hours. After thoroughly cleansing the exposed gut and the wound on the abdomen the former was replaced into the abdominal cavity and before closing up the wound on the anterior abdominal wall I had a final look in to see if everything was all right.

Now comes the important finding, and it is for the sole purpose of bringing that out that I have described this case here. At the level of the right internal abdominal ring, hanging backwards towards the posterior wall of the abdomen, was a small ball or sac attached by a thin, short pedicle and about the size of a healthy well-developed testicle. I was a little puzzled at first as to the nature of the tumour but on asking my assistant to find out if both testicles were in the scrotum the right one was found missing. Without this clue I believe I could not have made out by feeling alone what it really was as, unlike a testicle, this lump was more globular, softer and the epididymitis could hardly be distinguished and of course the testicular sensation could not be tested, the patient being under the anæsthetic. Inside the pedicle—if such a term can be applied to it—which was about half an inch long was a hard cordlike structure representing probably the vas deferens. In the erect position of the body this tumour must be hanging downwards in contact with the anterior abdominal wall. From the position of it I fear it will always remain a potential danger to the individual as it may be the means of causing strangulation or any one of the other possible accidents. To remove it at that time, I thought, was adding to the risk that the patient was already running.

The boy made an uninterrupted recovery and he left the hospital exactly on the 14th day after his admission. Before he left I made an examination of his right inguinal region and found that no defect could be made out by the mere examination of the part without taking into consideration the missing testicle from the right side of the scrotum.

OCCURRENCE OF CHYLURIA AFTER CONFINEMENT.

By S. SUNDAR RAO,

Darbhanga Scholar; Calcutta School of Tropical Medicine.

MANY years ago, Manson (1899) wrote that chyluria in women may often start soon after confinement, while in men any sudden physical exertion like running or jumping may precipitate an attack of chyluria. Since that

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

time, very little has been published on the factors that bring about such attacks.

The literature on chyluria in India is very meagre. The present instance is here recorded in order to draw attention to the necessity of a detailed study of all available cases both with regard to their clinical and laboratory findings and the factors which bring about these attacks.

Mrs. C., aged 22, had her first confinement at the Eden Hospital, Calcutta, without any complication in May, 1928. Twelve days after delivery she suddenly developed hæmato-chyluria and through the kindness of Lt.-Col. V. B. Green-Armytage, I.M.S., Professor of Obstetrics and Gynæcology to the Medical College and Surgeon to the Eden Hospital, who drew our attention to the case, she was admitted into the Carmichael Hospital for Tropical Diseases for observation and treatment. The following shows the results of the laboratory tests carried out:—

Blood for microfilaria: Present, 25 per 20 c.mm.

Blood hæmoglobin: 80 per cent.

Total R.B.C. count: 3,800,000 per c.mm.

Total W.B.C. count: 9,000 per c.mm.

Differential count:—

Polymorphs	..	66 per cent.
Lymphocytes	..	15 „ „
Mononuclears	..	8 „ „
Eosinophiles	..	11 „ „
		100

Stool for protozoa: *E. nana* cysts present.

Stool for ova: Ascaris ova present.

Stool for bacteria: No non-lactose fermenters present.

Urine:—

Sp. gravity	.. ..	1010
Reaction	.. ..	Acid
Albumen	.. ..	++++
Urobilin	.. ..	Nil
Sugar	.. ..	Nil
Indican	.. ..	Nil

Microscopic examination:—

R. B. C.	.. ..	++++
Microfilariæ	.. ..	++

Temperature was normal. There was no abnormality in the circulatory or respiratory systems. Spleen and liver not enlarged. There was no family history of any importance.

The patient did not show any filarial manifestations excepting the chyluria and the heavy incidence of microfilariæ in her blood and in the urine. She was put on calcium lactate grs. xx t.d.s. and stock mixed vaccine of streptococci and staphylococci alb. and aur. (Filarial) twice a week. The chyluria cleared after four days. The attack lasted for a period of twelve days. Since her discharge from the hospital to the time of writing, the patient has not had any relapse.

When the chyluria cleared, the urine which till then showed a large number of filarial embryos, did not show any embryos subsequently. But the blood which had a heavy incidence of microfilariæ, did not show any reduction in the number and has since continued in the same manner up to the time of writing.

The patient has a previous history of filarial infection. She was born in Rangoon and since her fifth year has been living in Bowbazaar, Calcutta, both of which places are endemic for filariasis. In 1924, she had an attack of fever with shivering, combined with an enlargement of the left inguinal gland. As the gland suppurated, it had to be incised. She had no further attacks of fever, nor any sign of filarial infection until the attack of chyluria twelve days after her confinement.

The other points of interest in the case discussed are:

The total absence of any filarial embryos in the breast milk of the patient as also in the blood of the baby, while the patient showed a heavy incidence of microfilariæ in her blood. As many as 25 to 60 embryos were present in 20 c.mm. of blood of the mother, while the three different examinations of the blood of the baby at night were entirely negative. The differential count of the baby's blood was as follows:—

Polymorphs	..	13 per cent.
Lymphocytes	..	81 „ „
Mononuclears	..	—
Eosinophiles	..	6 „ „
		100

The latter observation of the absence of filarial embryos in the blood of the newly-born infant, although possibly the first record from India, has been made from Fiji by Bahr (1910) who found "that the blood of newly-born infants of two filariated mothers gave negative results."

To summarise, the points of interest in the article are as follows:—

1. The onset of chyluria following confinement due to relaxation of pressure as also to the strain during confinement, either of which would cause the dilatation of lymphatics and their rupture.

2. The total absence of microfilariæ in the blood of the new-born baby and also in the breast milk of the mother even though the mother showed a heavy incidence of microfilariæ.

REFERENCES.

Bahr (1910). *Research Memoir of the London School of Tropical Medicine*, Vol. I, p. 43.

Manson (1899). *Tropical Diseases*: London.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A CASE OF SYPHILITIC BASAL MENINGITIS.

By M. N. PAI,
LIEUTENANT, I.M.S. (T.C.),
Indian Military Hospital, Poona.

WATER CARRIER, aged 22, who was undergoing anti-syphilitic treatment, was admitted into the Indian Military Hospital, Poona, on 11th March, 1928, for chronic inflammation of the anterior cervical lymphatic glands on both sides of the neck. These were removed by operation on 13th March, 1928, and found to be tuberculous in nature.

From 9th April, 1928, the patient began complaining of headache and fever, the latter usually rose to 100° or 101° in the evenings. A few days later (14th April, 1928), the patient developed paresis of the facial muscles on the left side, his headache became more pronounced and his evening temperature continued as before. On 27th April, 1928, he developed ptosis of both eyelids and convergent squint with definite facial paralysis on the left side.

On 28th April, 1928, his condition was as follows:—

He had a vacant stare, convergent squint, ptosis, paralysis of the facial muscles on the left side and lay curled up in bed with his head retracted and the neck muscles slightly rigid. He complained of severe headache and his right hand and fingers were playing over his right temple. There was paresis of both legs, definite paralysis of the external rectus as well as paralysis of the orbicularis. His optic discs were normal and there was no papillœdema or signs of optic neuritis. All reflexes were present, ankle clonus and Kernig's sign were absent. The patient was dangerously ill.

The patient was given potassium iodide gr. 20 t.d.s. by mouth, 40 c.g. of sulfarsenol were given hypodermically and leeches were applied to the right temple. On 29th April, 1928, the dose was increased to gr. 30 t.d.s. and on 30th April, 1928, to gr. 40 t.d.s. On the evening of 30th April, 1928, his headache subsided and the temperature came to normal.

The dose was maintained at gr. 40 t.d.s. for three days and then reduced to gr. 20 t.d.s. On 2nd May, 1928, the squint completely disappeared, retraction of the head was absent and the patient was able to sit up in bed without any support.

By the 15th of May the facial paralysis had completely disappeared, his temperature had remained normal since 30th April, 1928, and the patient was discharged to duty on 16th May, 1928. He humorously attributed the cure to the leeches, which he stated "pulled out the bugs from his brain."

His blood culture was sterile, cerebrospinal fluid contained endothelial cells with only a few lymphocytes and gave a strongly positive Wassermann reaction.

Major H. B. F. Dixon, M.C., R.A.M.C., Specialist in Medicine, Southern Command saw the patient in consultation with me and afforded me great assistance by suggesting the rapid increase in the dosage of potassium iodide.

A CASE OF CEPHALIC TETANUS.

By HARENDRA NATH BAGCHI, M.B. (Cal.),
Resident Medical Officer, Police Hospital, Calcutta.

THE following is a case of cephalic tetanus (Kaf. tetanus of Rose) originating without any visible wound, characterised by stiffness of neck, trunk and limb muscles, without involvement of the jaw or any paralysis of the facial muscles. There was difficulty in swallowing and regurgitation through the nostrils on account of spasms affecting the muscles of deglutition, simulating hydrophobia. The case was afebrile throughout. Major B. G. Mallya, F.R.C.S.E., I.M.S., Police Surgeon, Calcutta, successfully treated this case and by his kind permission I am publishing this note.

Sukdeo Singh, a well-built constable, aged 28, came to hospital on 26th June, 1928.

History.—Headache and pain all over the body on account of frequent tonic spasms affecting in particular muscles of deglutition, trunk and limb muscles. If he tried to drink anything he used to be suffocated by it and some portion used to be regurgitated through the nostrils. Walking or standing were alike impossible owing to tonic spasm affecting his trunk muscles. He was in agonizing pain when these spasms came on, could utter no word and was bathed in profuse sweat after it. There was stiffness of his neck muscles from the beginning. No history of dog-bite, diphtheria, fits of any kind or of venereal diseases could be elicited. No visible injury could be found.

Examination:—

Gums.—Healthy. *Tongue.*—Clean. *Spleen and liver.*—Normal. *Bowels.*—Constipated for 2 days.

Heart.—Tachycardia present, otherwise normal.

Pulse.—96 per min. *Blood pressure.*—120 m.m. of Hg. (Systolic). *Mouth, tonsils,* etc.—Normal. *Lungs*—Normal. *Reflexes.*—Normal. *Pupils.*—Equal and react to light. No discharge from his ears.

Onset.—Gradual. At first spasms were few and far between. There was only slight stiffness in the neck muscles and difficulty in swallowing liquids. Gradually the process extended and there was stiffness and spasm involving muscles of the body and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

limbs (orthotonus). The day after admission there was discharge from his ears.

Treatment.—

26th July. Patient put in a dark cool room. Calomel gr. iii on admission followed by magn. sulph. ℥i.

27th July. No motion. Soap and water enema: 2 ounces given without result.

Oil crotonis—min. i, on butter resulted in 5 clear and loose motions.

The following mixture was prescribed to be taken every 6 hours.

Re:

Chloral hydras	..	aá gr. xv.
Ammon. brom.	..	
Pot. brom.	..	
Tinct. hyoscyamus		min. xv.
Syrup auranti	..	ʒi.
Aqua	..	℥i.

Antitetanic serum 4,500 units injected daily for 4 days. Subcutaneous injections of (i) 2 per cent. sol. of acid carbolic min. 10 daily for 10 days, and (ii) 25 per cent. sol. of magn. sulph. 5 c.c. daily for 5 days.

Magn. sulph. ℥i given on alternate days to keep bowels acting. Ear syringed and spt. acid carbolic dropped into ear, B.D. *Diet.*—milk diet with fruit juices.

Daily progress.—28th May. Sleep disturbed. Spasms at frequent intervals but lasting a shorter time than before. Can swallow with difficulty.

30th June. Disturbed sleep. Interval between spasms increased. Can drink better. Discharge from ears stopped.

2nd July. No sleep. Spasms at longer intervals and lasting a short while.

4th July. Spasms less than before. Slept well. Can take nourishment.

6th July. There were no spasms. Patient can walk with assistance.

Taking solid food now.

ALASTRIM OR SMALL-POX?

By S. C. NAG,

In-Charge, Barbheel Tea Estate Hospital, Tejpur, Assam.

As, almost in every epidemic, there is noticed a good deal of similarity, as well as some points of difference between alastrim and small-pox, physicians are always interested in these two diseases, the source of interest arising from the relationship which alastrim may or may not have with small-pox.

Below is given a short note on a small epidemic of what I provisionally call alastrim:—

Between February 20th, 1928 and March 20th, 1928, there were 21 cases of an infectious eruptive disease among the labour force of a tea estate. The ages of these patients varied between 1 and 46 years, and all of them, except one, were previously vaccinated (eight being vaccinated only 1 to 7 years before). The disease was limited to the members of 7 families closely located in one line.

Regarding symptoms, primary fever was noticed in a few cases and it was of a mild type. In most of the cases the rash was small and scanty, but in a few cases the eruptions were large and profuse. In no case was the eruption so shotty. Vesiculation was not perfect in every case. Pustulation was not attended with rise of temperature, nor was the pustulation noticed in all the pocks. Umbilication was imperfect and occurred in not more than half the eruptions. Pitting was very slight and filled in in a few days, and under some eruptions there was no pitting. Crusts were not very hard and fell out in a few days. The eruption appeared all over the body—in some cases it was profuse on the face, in others profusion was noticed on the arm, in a few cases the eruption was noticed on the trunk and in one or two cases eruption was scanty in all parts. There were no complications and no deaths.

The patients and the contacts were isolated, and in the way of treatment weak carbolic oil with a trace of oil of eucalyptus was given to apply over the body. Iodine or potassium permanganate was not used.

Now the question may arise whether the above disease was small-pox, modified by previous vaccination, or whether it was alastrim—a different disease. It is, however, the combination of the following 5 points that tempts me to call the disease alastrim and to believe that alastrim and small-pox are two different diseases.

(1) Although all, except one, of the above cases were previously vaccinated, I revaccinated all the patients when they were ill, and in spite of their suffering, the vaccination was successful to some extent in those whose primary vaccination was performed long ago.

(2) The eruption was profuse in some of those who were primarily vaccinated 1 to 5 years before.

(3) The contacts i.e. the patients' relatives and attendants, who were secondarily vaccinated while in isolation, got the disease notwithstanding this recent vaccination.

(4) Constitutional symptoms were very mild and were noticed only in about half the cases.

(5) In some cases the constitutional symptoms were very mild, in spite of profusion of rash; had these cases been small-pox they would have shown severe constitutional symptoms.

(The writer does not seem to have considered the possibility of the disease being chicken-pox. ED., *I. M. G.*)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail).

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones. The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING

FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.

Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THE MENOPAUSE.

Two gland products of outstanding merit are offered by the Anglo-French Drug Co., for the treatment of Menopause troubles.

Opocrin Ovaro-Thyroid

Ext. Thyroid 3 cgm.
Ext. Ovarian 12 cgm.

Per bottle of tablets @ Rs. 3

Opocrin Ovaro Pituitary

Ext. Pituitary (total) 5 cgm.
Ext. Ovarian 10 cgm.

Per bottle of tablets @ Rs. 3

Dose Four to Eight "Opocrins" daily.

"OPOCRINS"

Superior Gland Products

For COUGHS whatever their origin

ONE GRAMME CREOSAL CONTAINS

Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

50 Centigrammes **CREOSAL** per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY.
P. O. Box 228, MADRAS.

Telegrams: "AMPSALVAS."

P. O. Box 7861, CALCUTTA.
P. O. Box 134, RANGOON.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

FEBRUARY.

THE PROBLEM OF POPULATION.

Two recent publications deal with the health, or rather with the lack of health, of Madras City; one is a report issued in 1927 by a committee which was appointed by the Government of Madras to investigate the causes of the high mortality of the city and suggest a remedy; the other is the 1927 report of the health officer of the city. Both of these documents are of a most depressing nature, although in each of them a brave effort is made to maintain a note of optimism.

The death rate of Madras City for 1927 was 42.3 per mille; it is only exceeded in India by one other city, Nagpur, which has a death rate of 47.15. The birth rate of Madras is 46.8; that of Nagpur is 61.23. These rates are not accurate, but errors in registration are those of omission and, therefore, the true birth rates and death rates are probably higher than those which are recorded. It is interesting to note that if we deal with the large cities of India there is a general correspondence between the birth rates and the death rates, and the same thing holds true when we consider the cities of the world; for example, Cairo with a birth rate of 53 has a death rate of 33.3. England with a birth rate of 16.6 has a death rate of 12.3 whereas in 1871-1880 the figures were 35.4 and 21.4, respectively. So that the birth rate and the death rate have fallen steadily and rapidly in sympathy with each other.

Madras City is divided into thirty divisions; if we take the fifteen divisions which have the highest birth rates we find that no less than twelve of these are among the 15 which have the highest death rates.

Comparing the rates for the various communities of Madras the same thing holds true, the birth rates are highest among the Moslims with 53 per mille, next in order being the Hindus with 47.2, Anglo-Indians (42.8), Indian Christians (37.8) and, last of all, the Europeans (19.0). The death rates are in exactly the same order being 49.3 per mille in Moslims, 42.9 in Hindus, 31.9 in Anglo-Indians, 30.7 for Indian Christians and 7.8 in Europeans. Statisticians have revelled in constructing curves of birth rates, death rates and population; they have shown that in settled communities, when there are no catastrophic occurrences, the population curve tends to reach a steady maximum which can only be exceeded if some new factor is introduced.

The average man is very sceptical where statistics and curves are concerned, but in the case of these birth rates and death rates the evidence is so overwhelming that the curves merely represent a graphic method of displaying obvious facts. Some statisticians ask us to believe that there is some mysterious and almost supernatural process at work which brings about the balance of population, but though we may admit that the factors concerned are complicated and variable it is not difficult to see how the limit of population is reached in the case of communities like those of Madras City. In each city the total available income of the population is strictly limited, it consists of (1) salaries derived from Government and other official appointments, (2) the wages, salaries and profits of people engaged in industries, (3) trading profits, (4) incomes derived from property outside the city, and (5) other miscellaneous sources of income. The only item which is capable of great expansion is (2) and even this is limited by conditions which are not easily controlled by governments or other organized agencies. The total income of the city is all that is available for providing food, clothing, houses, roads, water supplies, drains, etc. for the whole community, and so far as can be seen, the amount in the case of Madras, is only sufficient to maintain the existing population on a low economic level, many of the people being almost on the verge of starvation. Assuming that there is neither emigration nor immigration it is obvious that so long as the people of the working and clerical classes continue to marry and bring numbers of children into the world while the parents themselves are undeveloped and are unable to maintain themselves in comfort, the population as a whole is bound to suffer from serious under-nutrition with the inevitable result of a high infant and adult mortality. In the case of Madras a high birth rate must inevitably be followed sooner or later by a high death rate unless some fresh sources of income can be tapped or emigration restores the balance between food and population. Take what happens in the case of a typical family under existing conditions. An immature youth, before he is able to maintain himself in reasonable comfort, marries a wife who is equally immature; she proceeds to have infants for whom sufficient nourishment is not available, the whole family suffers from malnutrition, half of the children die before they reach the age of five and the survivors are stunted and inefficient. Multiply this example thousands of times and you have a picture of what is happening in Madras as well as in many other places in India. It is surely sufficiently obvious that so long as the people insist on having such high birth rates they must continue to submit to the toll which is levied by disease and malnutrition.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

There are two obvious remedies, which must be applied together; one of these without the other will be useless.

The first remedy is the prevention of the disabling diseases which seriously lower the efficiency of the people, and the second the adoption of a system of later marriages and the exercise of self-control or some other kind of control in connection with reproduction.

Hitherto we have been preaching disease prevention as the one panacea for the ills of India and we have been pointing to the triumphs of medicine in European countries; but we have ignored the fact that hand in hand with disease prevention other factors have been at work in Europe: smaller families have been coming into fashion, the development of industries has been raising the economic standards of the people to a much higher level and a tide of emigration has been relieving the stress of population. Had the people of Europe followed the Indian custom of early marriage and unrestrained propagation, the state of affairs there would probably be no better than in India to-day. In Ireland in the last century there was a striking example of what happens to people who indulge in unrestricted multiplication; the population in 1840 was over eight millions or more than twice what it is to-day and the people were living in conditions which would horrify the average Indian peasant. Then came the potato famine which demonstrated in a terribly ruthless manner the unsoundness of the economic position; it was only when the population was reduced to four millions by death and emigration that a new era of prosperity was introduced.

In India there are no longer catastrophies such as kept the population down in former times; the people suffer instead from a long-drawn-out misery to which they have become so accustomed that it is regarded as a dispensation of God, whereas it is really the inevitable consequence of ignorance and stupidity. What is needed is that the best brains among the economists, sociologists, agriculturists, industrialists, educationalists and medical scientists should be set to study the problem and to indicate clearly what we ought to teach the rising generation. At present we instruct them in the useful accomplishments of reading, writing and arithmetic, but we leave them to grope blindly in the dark in the matter of adapting themselves to their environment and of learning how to live healthy lives. The problem is difficult and complex, but we have no right to say that it is insoluble until we have made a serious effort to solve it and the sooner a beginning is made the better.

J. W. D. M.

CORRIGENDUM.

January number 1929, page 50—Tropical Gynæcology by Lt.-Col. V. B. Green-Armytage: *for* "Pp. xv plus 842 with 3 plates and over 100 photographic and other illustrations. Price Rs. 20" *read* "Pp. ix plus 249, Price Rs. 3-8."

SPECIAL ARTICLES.

THE CAMPAIGN AGAINST LEPROSY.

By E. MUIR, M.D., F.R.C.S. (Edin.),

Research Worker in Leprosy, at the School of Tropical Medicine and Hygiene, under the Indian Research Fund Association.

SINCE the inception of the Indian Council of the British Empire Leprosy Relief Association in 1925, a considerable amount of new interest has been taken in leprosy. The old method of forcible segregation has been replaced by voluntary clinics, training of doctors, investigation into local causes of high endemicity and propaganda based upon such investigation.

Although we do not as yet possess any cure for leprosy which may be called "a specific," yet we have at our disposal treatment which, when properly administered, will in the great majority of early cases, rid the patient of all active signs and keep him well, provided he continues to take the proper precautions; it will also heal up a large proportion of more advanced cases.

This fact has changed the whole aspect of the leprosy problem:—

(1) Leprosy now comes within the range of the physician instead of being looked upon as an infirmity and classified along with deaf-mutism and blindness as permanent and incurable.

(2) Patients formerly hid their disease as long as possible, fearing loss of employment and social ostracism, till it reached an advanced and comparatively irremediable stage. Now they come forward for early treatment in the hope of having the disease arrested before it becomes infectious or difficult to treat.

(3) Doctors who had little opportunity of studying leprosy in their college days, now have an opportunity for special training. Leprosy is a difficult disease to understand and has many aspects which differ from other diseases; therefore reading the literature is not always sufficient, and training by an expert is advisable.

(4) It is recognised that leprosy is more highly endemic in certain places and among certain classes of the community than in others. With a view to prevention it is very important that the causes of the disproportion should be investigated.

(5) Leprosy is an easily preventible disease. The spread of the contagion is dependent on ignorance, superstition and certain bad customs. If doctors have had little opportunity of knowing about leprosy, the people at large have had still less. Propaganda, therefore, is necessary among the people in general but especially within endemic districts and villages.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(6) As most of those afflicted with leprosy in the villages are poor and unable to afford to pay much for treatment, as the village doctors have not yet been thoroughly trained to treat leprosy, and as most doctors through ignorance are afraid to touch or come near leprous patients and are therefore unwilling to treat them, it is necessary to start leprosy clinics in village centres in endemic areas so as to place treatment within the reach of all.

The above will be sufficient to show the new lines along which leprosy may be dealt with. I think that merely stating the case is of itself sufficient to show that more hopeful results are to be expected by dealing with leprosy in this way than by merely segregating conspicuous pauper lepers, the great majority of whom have already passed through the infective stage, when they were really a danger to others, and have reached the comparatively harmless end-stage of deformity and disability which drives them to beggary.

During the last two years the British Empire Leprosy Relief Association has taken definite action along these lines. A survey party has made sample surveys in Bihar, Bengal, Burmah, the Central Provinces and Bombay. Not only have interesting and important facts been elicited as the result of their investigations, but the interest raised has resulted in the formation of clinics and a continuation of the survey along the same lines by trained doctors appointed by the provincial authorities.

The lines along which propaganda-treatment-survey work is run and the interest aroused are well illustrated by extracts from a report by Dr. I. Santra on work in the Akot taluk of the Akola district of Berar.

"Police station Akot is the northernmost part of district Akola. Its northern part is hilly and sparsely populated, while the southern part has a rich soil and is well populated.

Statistics:—
Area—206 sq. miles.
Population—42,878.
No. of villages surveyed:—
On the plains—71.
In the hills—19.
Total—90.
Lepers per sq. mile—2 (approx.)
Lepers per 100,000 population—949.
Percentage of villages affected:—
On the plains—44, or 62 per cent.
In the hills—7, or 36.8 per cent.

Leprosy census.—The number of lepers for Akola district according to the census of 1921 is 542. The Deputy Commissioner's census for the district is 2,153, or 4 times the census figure. The D.C.'s. figure for police station Akot is 150. Our figure for Akot is 407. We have seen that the D.C.'s figure for Akot is 4 times the census figure; if this be relatively true for the area of thana Akot, then our figure for Akot is about 10 times the census figure of 1921.

One remarkable fact during the village survey was that lepers came voluntarily to be examined. The disease is well recognised by the villagers and since there is no social ostracism for a leper, he comes voluntarily to be examined. In a certain village a man came to one of our workers and said 'Doctor, I have got leprosy.' No signs of leprosy being visible the doctor said: 'You are not a leper.' The man retorted 'What do you say? Here I pull out my hairs, and I don't feel,' and he began to pull out hairs from his leg.

It seems that there is an idea in the Central Provinces that there is more leprosy in Chattisgarh than anywhere else. We found more leprosy here in Akot than anywhere else. The reason why Chattisgarh has come into prominence is that the many leper asylums working in Chattisgarh have been trying to enlighten the public and the government about the existing state of leprosy there, while in Berar the people having enough to eat do not need to go begging and thus the lepers have not created conditions calling for the establishment of many leper asylums nor have they attracted the notice of the authorities.

Cases surveyed belong to the following classes:—

A1	175
A2	65
B1	68
B2	63
B3	36
Total	407

The number of A1 cases is proportionately more than in other places which may mean, either that we have failed to get all the A1 cases in other places while we have seen all the A1 cases here, or that the disease has been recently increasing, giving rise to so many new cases. The period during which these A1 cases have originated is synchronous with the increased communications due to the recently introduced motor traffic. We have enquired in the villages regarding the increase of the disease. Many said it had been present all along in their villages. Some said that now they have been seeing more cases. We leave it to the leprosy expert of the province to determine this point.

Leprosy on the plains and in the hills.—The reason why the percentage of affection of the villages in the hills is nearly half that on the plains is not that the hill peoples are healthier or take better food than the peoples of the plains, but is due to the sparseness of the population and absence of intercommunication. The people living on the borders of the Male Ghat Hills are the Korkus, Bhils and Nehals. We went as far as Koha, 36 miles from Akot and in the midst of the Male Ghat Hills, to enquire whether the hill people have leprosy among them in their own homes. It seemed to us that once upon a time these people were healthy and strong taking an active part in the communications between northern and southern India; but now as they live in the reserve forests their land is very limited, they do not kill animals for food, and as a result they looked to us very degenerate. Their love for animal food is so great that if they see vultures circling round an area the whole village follows them and gets at the carcass of the animal (probably dead of disease or old age) and brings it with great joy. They make their living by repairing roads and working for the forest department while they come down to the plains in the season as labourers. They have no indigenous name for leprosy. They call it 'Korhya' derived from the Urdu word 'Korh.' 'Korh' is a word that is in use in the parts north of the Male Ghats; 'Raktapith' and 'Maharoge' are words used in the south. The hill people probably had no leprosy amongst them and hence they have no indigenous name for it. When the northerners made their way to the south through these hills they must have taken the help of the Korkus. So the Korkus, having first come in contact with the northerners, might have seen leprosy amongst them or the northerners might have found leprosy amongst the Korkus and hence the origin of the word 'Korkya' (meaning the man who is a leper). We asked old men of the villages about the origin of the disease. They said they had seen it from their boyhood and they began to name lepers living far and wide in the hills. A B3 case in a village bordering the hills gave a history that 6 years before he got the disease two of his leper relatives, probably B cases, came down to the plains to work and used to stop at his house at night.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The different castes are affected in the following numbers:—

Kunbi	88	Mahratta	15
Mahar	63	Chamar	12
Mali	51	Gond	8
Musalman	27	Rajput	6
Bari (Growers and Sellers of Betel leaves)	17	Mahali	5
		Others	115
		TOTAL	407

The four most affected castes have 229 lepers.
The other 33 castes have 178.

The Kunbis are similar to the Kurmis of the Hindi-speaking country. Kunbis and Malis are cultivators. The well-to-do Kunbi represents himself as a Mahratta. Some say that the Kunbis are a part of the Mahratta nation. As for Mahars, Dheds and Mangs, though they occupy a position of considerable social degradation, few villages can exist without their services. They remove the dead animals, assist at funerals, help in the government work of collecting revenue, run errands, keep the public peace and work in the spinning and weaving mills."

Another method of combating leprosy has been adopted by the Bengal Branch of the British Empire Leprosy Relief Association. The amount of money available was small, only about Rs. 4,500 a year. It was decided to appoint a doctor as a propaganda officer and send him to the different districts of Bengal to spend a month in each and while there to train doctors, initiate dispensaries and make as far as possible a general survey of the prevalence of leprosy in the district. The following report for the month of November 1928 which was spent by the propaganda officer, Dr. Ghosh, in the district of Dacca shows the value of this method of working.

"As arranged, I arrived at Dacca on the 1st November, 1928, in connection with leprosy propaganda work under the auspices of the Bengal Branch of the British Empire Leprosy Relief Association. I had to deliver a series of lectures to the doctors in different batches and to the senior students of the three medical institutions. I saw the Civil Surgeon and Capt. P. Ganguly of the Medical School on the 2nd November, 1928, and arranged my first course of lectures to the teachers and demonstrators of the Dacca Medical School and to the senior students of the Dacca Medical School lasting for 4 days from the 5th November to 8th November, 1928, both days inclusive.

2nd Course. Place—Jaggannath Intermediate College. From 12th November, 1928 to 15th November, 1928.

This lecture was kindly organised by Capt. Ganguly and Dr. P. C. Sen, the Health Officer of the Municipality, for the private practitioners of Dacca town. Altogether 19 doctors attended the course and took a great interest in the subject. I got several cases for demonstration to the doctors.

3rd Course. Place—Dacca Medical School. From 19th November, 1928 to 22nd November, 1928.

This was organised by the Chairman of the District Board for the benefit of the District Board doctors only. Altogether 29 doctors attended this course. At first I suggested to the Chairman of the District Board that I was ready to take the D. B. doctors in 2 batches, but it was the intention of the Chairman that if the doctors attend in one batch they can have a discussion with me after the course of lectures as to the future running of a leprosy clinic. This was a good idea. The Chairman of the District Board is very sympathetic and is taking a good deal of interest in the leprosy problem of the district. He is also the Vice-Chairman of the Municipality and I hope he will try his best to start some centres as early as possible. The Health Officer of the District Board is also very keen. He himself attended one of the courses.

4th Course. Place—National Medical College. From 26th and 27th November, 1928.

This short course was meant for the senior students of the National Medical College. About 250 students attended the course together with some of their teachers.

5th Course. Place—National Medical College. From 26th November, 1928 to 28th November, 1928.

I had to deliver the last of my series of lectures to the teachers and senior students of the National Medical Institute. Twenty doctors and about 250 students of the Institute attended the course. The Superintendent of the Institute and Dr. Bose, are to be thanked for the excellent arrangements made for the lecture.

Leprosy Film.—First time shown on 19th November, 1928, at the Empire Theatre, for the Commissioners of the Dacca Municipality and the general public. This was organised by Dr. Sen, Health Officer of the Dacca Municipality. The hall was packed to suffocation, all available seats being filled up.

Second time shown on the 21st November, 1928, at the Cinema House, specially meant for the doctors, students and nursing staff of the Dacca Medical School. About 600 persons attended.

Third time shown on 23rd November, 1928, at the Cinema House. This was organised by Capt. Ganguly. The attendance was quite good. About 250 ladies were present on that day.

Fourth time shown on 27th November, 1928, at the Empire Theatre, for the students of the National Medical College and the National Medical Institute. Altogether, 500 persons attended.

In this connection I must thank the proprietors and Directors of the several Cinema companies of Dacca for placing their halls, their operators and projectors at our disposal free of any charge. It would not have been possible to arrange for so many shows if we had had to pay for these shows.

Leprosy Survey in the Dacca District.—As it was not possible to begin the actual survey of any thana I wrote to the District Health Officer asking for immediate information about the incidence of the disease in the various parts of the district. This will help us in selecting suitable places for starting leprosy clinics in the rural areas. When I left Dacca I did not get all the information that I had wanted from the Health Officer. I hope to get the required figures within a week's time. According to the 1921 Census there are 675 lepers in the district. I had to remain content with only a partial and rough survey of the Dacca Municipal area. One day I went out with the Health Officer of the Municipality and was able to detect nearly 15 advanced cases amongst the sweepers of the municipality. Another day I visited the densest part of the municipality and got as many as 15 cases in one lane. (Shakharibazar Street). All those cases were among the conch-shell manufacturers. They are doing all sorts of work, mixing with the public and taking no care of themselves though they know that they are lepers. They generally live in overcrowded, dark and insanitary houses. I wanted to take a photo of one of the houses in which they live but could not do so for want of a camera. I visited some other localities and was able to get cases everywhere. In all I saw about 65 advanced cases (B3 & A2) and a few early cases. If a systematic survey be carried out I think that there will be not less than 300 cases in Dacca town alone.

Capt. Ganguly and Dr. Sen, the Health Officer of the Dacca Municipality, are also of the same opinion.

Treatment Centres.—There is an outdoor leprosy clinic attached to the infectious ward of the Mitford Hospital under the direct supervision of Capt. Ganguly but the attendance was not very satisfactory only 5 or 6 patients attending. But as a result of the propaganda work during the last month more patients are now attending. I opened another centre at Nilkhet for the benefit of the municipal sweepers and others. I hope

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the authorities of the municipality will continue to treat the cases. In this connection I saw the Chairman of the municipality and discussed with him the possibilities of starting a leprosy centre at Dacca. He told me that as there was a leprosy clinic at the Medical School, Dacca, he did not see the necessity of starting another centre. However, after he had listened to me and the Health Officer he was convinced of the efficacy of such a treatment centre and promised to start a centre as early as possible.

I also saw the Chairman of the District Board and discussed with him about starting 4 centres in the rural areas. He was very sympathetic and I hope he will try his best to start some centres as early as possible. I suggested that one centre should be opened in each subdivision."

It is very important that, when doctors are trained in leprosy in any area, there should be a leprosy dispensary started in that same area under expert direction so that there may be a practical demonstration of the effects of treatment. This will lead patients and the public to realise that leprosy is remediable, and will act as a centre for propaganda.

One of the chief difficulties in getting patients to come for treatment and to continue treatment long enough is the belief that leprosy is irremediable. This prejudice can only be broken down by actual demonstration of results, and to do this in a new area there is required a well-conducted dispensary run by a doctor who has had considerable experience of leprosy treatment. This also gives confidence to other doctors to treat cases and provides a consultant whose advice they can seek in difficult cases.

HINTS ON THE VILLAGE NURSE SCHEME.

By G. McGUIRE, I.M.D,

Civil Surgeon, Karnal, Punjab.

SEVERAL attempts have been made in the past to provide medical relief to India's millions and the Punjab has at last given the lead by providing rural dispensaries.

Not much attention so far, however, has been paid to the solution of the problem of medical aid to the women in the villages, who suffer torture, nay, death at the hands of the antediluvian, dirty, indigenous dai, rather than take advantage of the facilities offered in a rural dispensary in charge of a male doctor.

The horrors of confinement are seen everywhere, in a hovel in the poorest village and in the rich palaces. You will be told that carpenter's tools are used in cases of obstructed delivery.

It was in the middle of the year 1925 that an attempt was made, with the assistance of my wife and in the face of a great deal of ridicule, to provide some help for the women in the villages by adding to the number of qualified nurses in the district.

Local bodies could not be approached for aid as one could not expect that they would dole out money on an experiment, for a scheme in its initial stages.

Beset with difficulties, subscriptions were started, the obstacles were gradually overcome and eventually money poured in. The response was so satisfactory that the original plan of having 2 or 3 additional nurses was abandoned and a nurse at every dispensary in the district was the goal aimed at.

Enthusiasm being roused, the whole district at last was convinced of the utility of the scheme, and people came forward in numbers of their own accord asking for the services of trained nurses. The District Board, at this stage, were prevailed upon to pass a resolution providing a nurse in every dispensary if subscriptions of Rs. 1,500 were raised by the people of the area.

This is how, from two nurses in the district there are now 22 working in the rural areas, breaking through the prejudices and superstitions and rendering help to the women in the villages at a time when it is most needed.

AIMS OF THE SCHEME.

The aims of this scheme are to supplement a much felt want in the rural areas, as it is not possible in the near or distant future to have a relay of trained lady doctors.

Nurses and nurse-dais trained in midwifery would, therefore, be able to play an important part in reducing puerperal fever, ousting the untrained indigenous dai from her secret haunts and, in time they will be called upon to play an important part in the general and social uplift of the women.

This scheme once started, with a nurse or nurse-dai in every dispensary, will soon break the first barriers of superstition and prejudice.

Let there be a small beginning and employ the illiterate trained nurse-dai who can mix freely with the women of the villages. She will instil greater confidence and work will soon be established.

When this stage is reached, nurse-dais of this class could be drafted out into the villages away from dispensaries to train and control the untrained indigenous dais and supply them with the necessary equipment for normal labour cases. In their place the better and more educated type of women with a nurse's diploma could be posted. The mentality of the rural folk being now prepared, it would not be a difficult task for the nurse to launch out on instructional lines as well, in health, nursing, etc., and to contribute largely to the happiness of the women in the villages.

No dispensary should be without a nurse, and no village without a trained nurse-dai to supervise the work of her untrained sister, instruct her in cleanliness and supply the wants necessary for a successful confinement. If we are going to wait for knowledge to penetrate in its own good time from the larger towns and cities where so many facilities exist and so much is being done for the women, then we are going to wait for centuries and even then a large part of our work will remain unaccomplished in spite of the strenuous attempts at education.

Prejudices and superstitions in the villages can only be broken through the agency of medical aid which, in India, is held in high esteem and, therefore, the education of female rural children should go hand in hand with medical relief.

It is not intended that these nurses should take the place of lady doctors and even though these nurses would fail to be useful in obstructed delivery, thousands of women whose labour is normal and who nowadays die from puerperal fever through sheer neglect and want of ordinary aseptic precautions at the hands of the ignorant untrained indigenous dai, will be saved.

With a scheme of this nature we shall have a large body of women scattered throughout the length and breadth of the Punjab working silently for the general uplift of the rural women, and in a quarter of a century these women in turn will be moving forward towards the goal of modern civilisation.

HOW TO BRING THE SCHEME INTO EXISTENCE.

It is not intended that every civil surgeon in the Punjab should attempt to start on the lines on which the scheme was first started, as this means time, labour, money, and also a certain amount of good fortune. There are, however, three important methods by which one could start the scheme on a sound basis.

(*a*) Government aid.

(*b*) An independent body working under the orders of the Inspector-General, Civil Hospitals, Punjab.

(*c*) A Ladies' Committee in each district with the wife of the Deputy Commissioner as President.

Given the money, and all other considerations being fulfilled, we have to look around for the material. It will naturally be asked where and how it is to be obtained.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The Ludhiana Medical School is the chief training centre at present and other Mission Hospitals also play a small part in training nurse-dais. Even if these institutions were given a grant to expand their activities and to provide teaching facilities, they would be unable to meet the requirements of the Punjab.

Scholarships of Rs. 30 p.m. to nurse candidates and Rs. 20 p.m. to nurse-dai candidates with free quarters would be a great inducement.

Deputy Commissioners, who exercise a great deal of influence in the districts, will find no difficulty in providing the candidates. Christian villages are to be found in every district and these folk have no prejudices and will be glad to take up the profession. There are poor Mohammadan women, also, who would be glad to earn a living. The Arya Samajists are also coming forward in the field of advancement, and they, too, would supply women and thus balance each community. Then there are also the indigenous dais who could be selected for training on the same condition.

A certain number of scholarships should be allotted to each district for candidates trained yearly at each district and tehsil head-quarter hospital.

Candidates are more likely to come forward for training in their own district than go elsewhere owing to family considerations, etc. Illiteracy should not be a disqualification at the onset for the nurse-dai certificate.

Four scholarships of Rs. 30 p.m. and four of Rs. 20 p.m. should be allotted to each district and half the number to tehsil head-quarter hospitals.

Candidates who know sufficient English to pass the 5th grade dispenser's examination should be given Rs. 30 p.m. and permitted to undergo a four years' training for the nurse's diploma. Those who can read and write the vernacular or are illiterate should be given Rs. 20 p.m. and a nurse-dai certificate would be granted to them after two years. Candidates willing to work in the male wards should be granted a higher scholarship.

The indigenous dai should be given the same scholarships as the nurse-dai if she consents to undergo her training at district or tehsil head-quarter hospitals. On completion of their training these nurses and nurse-dais should be sent to the central midwifery training ground (Ludhiana) for a period of three months to witness an additional number of maternity cases, to obtain a wider outlook, and to appear for their examination.

Those who are successful should be provided for by the local bodies. Assuming that sufficient material in midwifery is not available at district and tehsil head-quarter hospitals for the necessary training, it must not be forgotten that the training of nurses comprises other branches also. Their time could, therefore, be well spent in the study of cleanliness, first-aid, nursing, hygiene, etc., and their knowledge of midwifery could be supplemented by instruction on the dummy. Their last three months at Ludhiana would then fit them to administer help in normal labour to their sisters in the remotest villages.

The presence of these nurse-dais working out in the districts, would also help to secure a supply of material for the district and tehsil head-quarter hospitals. These women would eventually exercise a great deal of influence in the villages, and they could be instructed to send cases to these hospitals, thus supplying the necessary material for training purposes.

THE AMENABLE INDIGENOUS DAI.

I lay particular stress on the training of these persons as they form the pivot around which centre all things pertaining to women in the villages.

They should be induced to take a training at any cost, as with their experience, a course of training for 6 months on scientific methods would turn them into excellent dais. A certificate, granted after a 6 months' training and 1 month's post-graduate work yearly at district or tehsil head-quarter hospitals, would be a good beginning. The scholarship of Rs. 20 per month would be an encouragement for them to come forward.

Those who are not willing to leave their villages should be allowed to attend their rural dispensaries for a year with a scholarship of Rs. 10 p.m. and then induced to go to the head-quarter hospitals for 3 months to entitle them to their certificates. These persons could be employed in their own villages or in a village where a dispensary exists and given a lower rate of pay than the trained nurse-dai, viz., Rs. 25 to Rs. 35 p.m. They would then be under some control and with facilities at their disposal (free supply of lotions, dressings, etc.), they would play an important part in reducing puerperal fever. The indigenous dai is faced with two great evils at present. Ignorance of cleanliness, and the custom of receiving for the services she renders a sum which is hardly sufficient for her existence, much less to provide her unfortunate patients with the expensive necessities which medical science demands.

THE UNWILLING INDIGENOUS DAI.

Some are too old for any sort of training, while others are like volcanoes who pour out a volume of abuse on any innovation. A keen medical officer, and an equally keen nurse should win them over, pay them an honorarium of Rs. 5 p.m. or else pay them the fees they are ordinarily entitled to from each patient, and let the patient pay them also and in this way bind them down to send for the trained dai of the village for every confinement case. Give them full facilities and let them do the work under trained supervision and also attend to the soiled linen of the patient. One of them could be employed as a permanent assistant to the trained nurse and paid Rs. 10 p.m.

Sanads, in gold letters, which are highly esteemed by rural folk, should be given for help and assistance afforded to the trained nurse.

The medical officer should keep a register for the indigenous dais in his village, and when they report to the dispensary for their dues inquiries can be made from them of the work done independently and the number of deaths, the medical officer having previously obtained this information from the police.

When the indigenous dais report to the medical officer of the dispensary for their dues it will be a sort of pseudo-registration and will convey the impression of "non-absolute independence." Unless the country has sufficient numbers of trained dais, legislation cannot be enforced to prevent the untrained from working, but as soon as the supply equals the demand we could then take upon ourselves to prohibit the untrained from working in villages where dispensaries exist. In this way control will be established and new indigenous dais will be prevented from taking up the profession. Once work is set in motion, compensation and other rewards should be gradually reduced and the savings thus effected should go towards extending the scheme.

Do not condemn the indigenous dai, as it is poverty, force of circumstances and ignorance in cleanliness that places the high rate of mortality at her door.

DIFFICULTIES TO BE OVERCOME.

1. The first impression to be dispelled will be that a nurse-dai has not been posted for the purpose of reporting cases of infanticide to the police.

2. You will be told that custom has taught wives to believe that to change their dai for the trained nurse is like changing their husbands.

3. The trained nurse should not be allowed to take fees. It would be better to pay her compensation of Rs. 5 p.m. instead, otherwise she will not be able to stand in the field of competition with the indigenous dai, whose fees are As. 4 for a male and As. 2 for a female child, whether called during the day or night. For this small sum she is expected to pay regular visits for ten days, attend to the soiled linen of the mother and child and, if Fate decrees, knead the patient out of existence. If the trained nurse is allowed any fee at all it should compare favourably with that of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

indigenous dai but she should be provided with an assistant to wash the soiled linen.

4. False rumours circulated by the indigenous dai, hakims and vaids will have to be overcome.

5. The greatest difficulties are the obstacles put in the way of the nurse-dais by medical officers who fear loss of prestige and practice. This can be overcome by the controlling authority in the office of the Inspector-General, Civil Hospitals. This controlling authority is very essential to ensure assistance from the medical officers and to promote enthusiasm for the furtherance of this work in the early stages.

6. Another great difficulty is the independence of the nurses and nurse-dais owing to the demand being greater than the supply. They have no fear of losing their appointments as they are readily provided for in another district, sometimes on a higher salary. These ideas have encouraged laziness in their duties, and frequent dismissals and resignations follow so that the work is retarded. If the output equals the demand and employment is debarred to those who have been dismissed, good work will soon be noticed.

8. Under no circumstances should medico-legal work, of any description, be allowed by nurses or nurse-dais. Infringement of this rule should be most severely dealt with.

LADIES' COMMITTEE.

This should comprise the wives of the officials and other ladies interested in the welfare of the women. If the wife of the Deputy Commissioner were to pay an occasional visit to some of the nurses and nurse-dais news would soon go round, and molestation of the nurses would be of rare occurrence. This would also instill confidence in the nurses. A lady doctor from head-quarters touring the district sometimes and a few lady sub-assistant surgeons posted to rural dispensaries would also act a great stimulus.

FACILITIES TO BE GRANTED TO TRAINED NURSES.

1. A small monthly allowance of Rs. 5 p.m. should be paid and no private practice allowed.

2. For all maternity cases they should be authorised to supply free medicines, dressings and diet to poor patients, either at the hospital or at the patient's home.

3. A female assistant on Rs. 10 p.m. should be provided to serve as a protection, to wash the soiled linen and to do the other dirty work free of charge.

Indigenous dais who can live in the hospital premises and are willing to take up work as assistants should be given preference as an experimental measure.

The wives of sweepers of the dispensaries would be very useful also as assistants and no objection will be raised as a large number of this class carry on the work of indigenous dais.

4. Husbands of nurses should be provided with posts as school masters in the same village, or else given preference of employment in a rural dispensary or other appointments in the village.

5. Trained nurse-dispensers or nurse-dais, employed as a means of protection for the nurse posted to the dispensary, would double the expense and the difficulty of washing the soiled linen would still continue.

6. The class of female dispensers should be abolished. Every female employee (except menials) should have a midwifery qualification.

POST-GRADUATE WORK.

This should be insisted on for all classes of nurses.

1. *Nurses.*—They should be deputed for three months at a central training school (Ludhiana) every three years and given all inducements in pay, travelling allowances, etc.

2. *Nurse-dais.*—They should be deputed for the same period and at the same centre every two years.

3. *Indigenous Dais.*—They should undergo their training at the district or tehsil head-quarter hospitals for a month each year.

If efficiency is to be established post-graduate work is essential.

PAY TO THE NURSE AND NURSE-DAIS.

1.	Nurses in male wards ..	Rs. 70 to Rs. 80 p.m. and free quarters.
2.	Nurses in female wards ..	Rs. 55 to Rs. 70 p.m. and free quarters.
3.	Nurse-dais for male wards who are able to read and write English.	Rs. 50 to Rs. 65 p.m. and free quarters.
4.	Nurse-dais for female wards who are able to read and write English.	Rs. 45 to Rs. 60 p.m. and free quarters.
5.	Nurse-dais for male wards who are either illiterate or can read and write only the vernacular.	Rs. 45 to Rs. 55 p.m. and free quarters.
6.	Nurse-dais for female wards who are either illiterate or can read and write only the vernacular.	Rs. 40 to Rs. 50 p.m. and free quarters.
7.	Trained indigenous dais ..	Rs. 25 to Rs. 35 p.m. and free quarters.

Private practice should not be allowed in the villages. Rs. 5 p.m. as compensation should be paid.

WORK TO BE EXPECTED FROM NURSES AND NURSE-DAIS DURING THE FIRST YEAR OF SERVICE.

A nurse or nurse-dai on first being appointed will find that she has very little to do for the first month beyond attending to the women and children of the out-patient department of the dispensary. She should, therefore, embark on her duties at once by doing house-to-house visiting daily and making it a part of her duties to become intimate with the indigenous dais of the village, wives of the school master and sub-inspector of police and other important residents. Before the month comes to a close, with a keen medical officer helping the nurse, an increase of the women and children attending the out-patient department will be the first signs of her popularity. In the first three months she should have two or three maternity cases to her credit and at the end of 6 months a monthly average of 3 cases. Her average work for the year should not be less than 6 cases monthly. If the monthly average for the first 3 years is 10 I would call this a good record.

Government, or the local bodies, should insist on 15 cases of confinement monthly from each nurse after the third year of service. No nurse or dai should be entitled to promotion if she does not attain to this standard. To work up to this degree of success she will have to keep up a high level of popularity and thus she will be in a position to undertake other useful work also.

A hall, with a purdah wall and a garden in a remote corner of those dispensaries with large compounds, would add to the already existing facilities for a happy village life. The building would serve as a meeting place for instructional purposes, where an exhibition of babies' requirements, first-aid equipment and other domestic necessaries, would all tend to improve the knowledge of the women.

RECORD OF WORK OF NURSES AND NURSE-DAIS IN THE KARNAL DISTRICT FROM 1ST JANUARY TO 30TH JUNE, 1928.

The record given below is very encouraging though it was carried out under most trying conditions. Nurses were obstructed in their duties. Several nurses resigned or were dispensed with thus throwing the work back. Confusion followed, often creating an impossible situation as it was not easy to replace the nurses.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Name of Dispensary.	Nurse or Nurse-dai employed.	Number of confinements.		Total confinements.	Remarks
		In Hospital.	In the village.		
1. Asandh	Nurse.	—	62	62	....
2. Pehowa	"	—	29	29	Employed for 5½ months. The first nurse that was appointed for 2 months was found demented and did no work.
3. Thanesar	Nurse-dai.	2	8	10	Employed for 4½ months. Friction with staff.
4. Ladwa	Nurse.	1	10	11	Friction with medical officer.
5. Gulha	Nurse-dai.	—	15	15	Small village with a population of 400. A lazy nurse but has promised to do better.
6 Pundri	Nurse.	—	21	21	Well educated nurse. Friction with medical officer. Will do better.
7. Kunjpura	Nurse-dai.	—	4	4	Employed for 6 weeks only. There were 2 changes.
8. Panipat	Do.	1	60	61	....
9. Kaithal	Do.	—	13	13	There were about 3 changes of nurses in 5 months.
10. Shahabad	Do.	1	28	29	....
11. Thaska	Do.	2	7	9	A lazy nurse. Has lost her increment. Has promised to do better.
12. Ahar	Do.	—	50	50	....
13 Indri	Do.	—	37	37	....
14. Bhagal	Do.	—	26	26	....
15. Rajaund	Do.	—	56	56	....
16. Siwan	Do.	—	23	23	Employed for 5½ months. This place is vacant at present.
17. Samalka	Do.	1	12	13	Employed for five months. The first nurse was employed for 2½ months and then dispensed with as she observed purdah.
18. Garaunda	Do.	—	67	67	....
19. Radaur	Do.	—	44	44	....
20. Taraori	Do.	—	24	24	A small village.
21. Municipal Health Centre, Karnal.	Nurse.	—	35	35	Two changes.
22. Lady Chelmsford League, Karnal.	Do.	—	25	25	A sickly nurse.
23. City Dispensary, Karnal.	Nurse-Dai.	-	—	—	Only attends to out-patients.

CONCLUSION.

It has already been made quite clear that thousands of lives are being lost yearly in the rural areas. Normal cases of confinement are exposed to the ravages of puerperal fever through sheer neglect, ignorance and want of the ordinary aseptic precautions. In the awakening of New India there is a change in mentality and a universal eagerness in large towns and cities for education among women, for change in their customs and for service in the various walks of life. The enthusiasm for a general improvement surrounding the lives of women is noticed throughout the length and breadth of India.

Many schemes have come into existence in recent years which aim at the welfare of the women and the reduction of infantile mortality, but these activities have so far been confined to the large towns and cities where all facilities exist for the women.

Rural dispensaries cater for the men only and, therefore, fall hopelessly short of the provision that is rightly expected for the women.

Local bodies are not in a position to finance any large undertaking and, therefore, Government should come to the assistance and provide the funds.

A body of nurses and nurse-dais in the districts trained in midwifery and paid for by Government will soon overcome most of the difficulties. The lives of thousands of women who die from sheer neglect will be saved; ideas of sanitation will penetrate into their homes and add to the prosperity of the country.

To a casual observer it would appear that the cost of such a scheme would be prohibitive but it must not be forgotten that half the scholarships granted will not be utilised for at least another 5 years. It is only a safeguard for local bodies and civil surgeons to have a free hand in the matter of procuring candidates. Some

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

districts may utilise the whole of the scholarships allotted, whereas others may not be successful at all. When the supply equals the demand, things will adjust themselves, it will then be time to reduce gradually the attractions by cutting down the number and amount of scholarships.

The pay of the old army of indigenous dais can be reduced also and a new army trained and engaged on a lower wage.

If we have rural dispensaries within a radius of 2½ miles, with a qualified dai in each, it will meet the needs of the people for the present, to a large extent, and save thousands of lives.

Current Topics.

Quinine Troposan in the Treatment of Chronic Benign Tertian Malaria.

By J. A. SINTON,
MAJOR, I.M.S.,
W. BIRD,
MAJOR, R.A.M.C.,
and
W. B. F. ORR,
CAPTAIN, R.A.M.C.

(*The Ind. Journ. Med. Res.*, Vol. XVI, Oct. 1928, p. 333.)

ENCOURAGED by the effects of quinine-stovarsol in benign tertian malaria, Messrs. May and Baker, Ltd., London, have produced a new arsenical compound, quinine-troposan, which they have kindly sent us for trial.

This drug is the quinine salt of 2-oxy-5-acetylamino-phenyl arsenic acid and so is closely allied to quinine-stovarsol.

The makers have tested its toxicity on mice and find that troposan is only about half as toxic as stovarsol in these animals. Tested against infections of *T. equiperdum* in mice the ratio of minimum toxic dose to minimum curative dose was found to be 1 to 100 as compared with 1 to 11.3 in the case of stovarsol.

The drug was tested on British soldiers suffering from chronic benign tertian malaria. These patients were treated under the same conditions as already fully described in other articles of this series. The methods of control, detection of relapse, etc., were similar to those detailed previously.

In all cases, the disease was diagnosed by the finding of *P. vivax* in the peripheral blood immediately before the commencement of treatment. A preliminary purgation with calomel and magnesium sulphate was given to each patient before the commencement of all forms of treatment.

The treatments were divided into groups as follows:—

I. *Test Treatments.*—(*a*) Quinine-troposan (QT. 1) and (*b*) Quinine-troposan (QT. 2).

II. *Control Treatments.*—(*a*) Plasmoquine (PM.); (*b*) Plasmoquine compound (PMC.) and (*c*) Quinine (QAT.).

Test Treatments.

Quinine-troposan was administered in tablets of 0.2 grm. each. These tablets contained the drug in the proportion of 50 per cent. quinine and 40 per cent. troposan.

(*a*) *Treatment QT.* 1.—Patients undergoing this treatment were given three tablets of quinine-troposan twice daily for a period of 28 days. This is equivalent to a daily dose of 0.6 grm. (9.3 grains) troposan and 0.75 grm. (11.6 grains) quinine. The total amount given to each patient during 28 days was 16.8 grms. (260 grains) troposan and 21 grms. (324 grains) quinine.

(*b*) *Treatment QT.* 2.—On account of the absence of any toxic symptoms following treatment QT. 1 and of the lower toxicity of the drug as compared with stovarsol, the dosage was increased. The patients in this series received three tablets thrice daily for 14 days and three tablets twice daily for the next 7 days. The initial dosage was, therefore, 0.9 grm. (13.8 grains) troposan and 1.125 grm. (17.3 grains) quinine daily for 14 days, followed by a dosage similar to that in treatment QT. 1 for another week. The total amount of drug given each patient was the same in the two treatments.

In both these treatments, 60 grains (4 grms.) of magnesium sulphate was given each morning before the administration of treatment, to promote free elimination of arsenic. One ounce of mist. alkali (sod. bicarb 60 grains, calcium carb. 2½ grains, sod. citrate 40 grains and water to 1 ounce) was given before each dose of the drug to protect the kidneys. In addition 15 drms. (60 grms.) of sugar in solution was also given before each dose to protect the liver. These are the precautions already described for the prevention of poisoning by the newer arsenical compounds. The last 24 patients in treatment QT. 2, only received the sugar mixture on one occasion and no ill effects were noticed.

Control Treatments.

(*a*) *Treatment PM.*—These patients received 0.08 grm. plasmoquine daily until the treatment had been given on 28 days. The treatment has been fully described in a previous article.

(*b*) *Treatment PMC.*—In this treatment the dosage was ten pills of plasmoquine compound daily until 28 days of treatment were completed. This corresponds to 0.10 grm. plasmoquine and 1.25 grm. (19 grains) quinine daily. Fuller details are given in the paper previously mentioned. These two control treatments were carried out at the same time as treatment QT. 1.

(*c*) Treatment QAT.—These patients were given 0.78 grm. (12 grains) quinine sulphate twice daily in a solution made with citric acid and flavoured with chocolate. The quinine treatment was continued for 14 days, total 21.7 grms. (or 336 grains) quinine and was followed by an iron and arsenic tonic for 7 days. This treatment is on the lines of that recommended for the Army in India. The treatment was used as a control for treatment QT. 2, but as about 40 per cent. of the patients could not be followed afterwards by blood examination, on account of Service difficulties, its value as a control is greatly diminished.

Effects of Treatment in Preventing Relapses.

Test Treatments—(*a*) *Treatment QT.* 1.—Twenty patients were given this treatment and of these one was lost sight of after seven weeks' observation, ten relapsed, and nine completed observation without relapse. The relapse was, therefore, a possible maximum of 55 per cent. with an observed minimum of 50 per cent.

(*b*) *Treatment QT.* 2.—Forty-four patients were treated by this method. Thirty-eight of these were observed by weekly blood examinations and of these fourteen relapsed and twenty-two completed observation without relapse. The other two patients were observed by blood examination for seven weeks only, but had no history of relapse up to three months after this time, i.e., nearly 5 months after completion of treatment. Six other patients were treated by this method but were only observed by blood examination for a couple of weeks. The later histories of five of these six patients were obtained, and in only one case was a relapse recorded up to the end of over three months after the finish of treatment.

The observed minimum relapse rate among the 38 patients of this series was 37 per cent. with a possible maximum of 42 per cent. If the patients observed by clinical methods only are included, the rates are 34 and 36 per cent. respectively.

The possible maximum relapse rate among the 58 patients observed by blood examination, after treatment with quinine-troposan, was 46 per cent. and the observed minimum 41 per cent.

Control Treatments.—(*a*) *Treatment PM.*—Of the twenty-two patients in this group, two were unable to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

stand the treatment and three others relapsed after the treatment finished. The failure rate was, therefore, 22 per cent.

(*b*) *Treatment PMC.*—None of the twenty patients who underwent this treatment were recorded as relapsing but two were only observed by blood examination for 5 and 6 weeks respectively. The after-histories of these two cases showed no relapse three months later. The relapse rate was a possible maximum of 10 per cent. and an observed minimum of nil.

The observed relapse rate in the 42 cases in these two series was 12 per cent. with a possible maximum of 16.6 per cent. These patients were the control group for treatment QT. 1.

(*c*) *Treatment QAT.*—There were sixty-eight patients in this series of whom 19 relapsed and 25 were lost sight of before the end of observation. The possible maximum relapse rate was, therefore, 65 per cent. with an observed minimum of 28 per cent. The variations in the estimated relapse rates in this series, due to inability to complete observation, make the results of no great value. However, during the experiments in this enquiry, over 1,100 British patients suffering from chronic benign tertian malaria have been treated under similar conditions with various cinchona alkaloids and the relapse rate among these has been 60 to 70 per cent., which figure serves as a good guide to the average relapse rate after quinine treatment.

Discussion of Results.

The relapse rate observed among the patients treated with quinine-troposan was greater than that seen in the plasmoquine series, but less than the usual rate seen after treatment with the cinchona alkaloids only. Troposan would, therefore, appear to be a useful adjuvant to these alkaloids.

When quinine-stovarsol was tested in an almost similar dosage to that in treatment QT. 1, the relapse rate was 60 per cent., so quinine-troposan is possibly an improvement on the former drug in the treatment of chronic benign tertian malaria.

Using the more intensive treatment (QT. 2), the possible maximum relapse rate fell from 55 to 42 per cent., as compared with QT. 1, while the minimum rate fell from 50 to 37 per cent. It would seem from these figures that the more intensive treatment gives better results, and it is suggested that the dose of 9 tablets daily might be tried for 21 days or even a more intensive course given. In trying such treatments, it is essential that the precautions mentioned above to prevent arsenical poisoning, should be carried out.

Toxicity of Quinine-Troposan.

The daily dosage of quinine-troposan in treatment QT. 2, corresponds to 0.9 grm. troposan and was continued for 14 days. In our work with stovarsol, the largest dose of that drug given daily over a similar period was 0.64 grm., in the form of the quinine-stovarsol compound. The comparatively larger dose of troposan was well tolerated and no toxic symptoms were observed, although they were with the PM. and the PMC. treatments.

This drug was so well tolerated that it is suggested that a course of 9 tablets (0.9 grm. troposan) daily for 21 days might be tested, to see whether such treatment would reduce the relapse rate still further. Even 12 tablets (1.2 grm. troposan) daily might be tried for a shorter period, but in either case the precautions recommended above to prevent arsenical poisoning, should be carried out.

During the course of this enquiry into the treatment of malaria, over 150 patients have been treated with either stovarsol or troposan, usually in larger doses than those with which other workers record toxic symptoms. Except for one case of slight jaundice after an intravenous injection of 1 grm. sodium stovarsol, we have never seen any deleterious effects after the use of these drugs, although a very careful watch was kept for such manifestations.

The only conclusion we can draw from this fact is that the administration of sugar, alkali and magnesium sulphate has had a definite preventive action and should always be given when either of these drugs is used.

Conclusions.

Under the conditions of our work, troposan appears to be a very useful adjuvant to quinine in the treatment of chronic benign tertian malaria.

The relapse rate after the use of quinine-troposan was less than that usually seen after the cinchona alkaloids or after quinine-stovarsol, but was greater than after plasmoquine or plasmoquine compound.

The drug has been well tolerated over a period of three weeks of continuous treatment, even when given in larger doses than was stovarsol, but prophylactic measures should always be taken against any chance of arsenical poisoning.

The Treatment of Chronic Benign Tertian Malaria with Smalarina Cremonese.

By W. BIRD,

MAJOR, R.A.M.C.

(*The Ind. Journ. Med. Res.*, Vol. XVI, Oct., 1928, p. 347.)

DURING the last few years the Italian physicians have claimed that a new drug—Smalarina Cremonese—is more effective in the treatment of malaria than the cinchona alkaloids, more especially in the chronic benign form.

Cremonese (1925), the originator of this new treatment, claims that quinine acts as a febrifuge only and does not produce a permanent cure of malaria, while Smalarina Cremonese has no febrifuge effects but acts slowly so as to produce eventually a permanent cure. The drug is believed by him to stimulate the organic defences of the body and so produces an immunity, which may persist for two years.

The immediate results claimed for the drug are that during the first month of treatment it produces an interruption of the fever, a reduction in size of the liver and spleen and a disappearance of the pallor and anæmia of the patient. At the same time the patient's appetite returns and his weight increases.

In carrying out the treatment, Cremonese (1925) explains that Smalarina acts slowly and, biologically, has little effect as a febrifuge and that quinine should be given in order to control the fever, while Smalarina should be administered in the intervals when its therapeutic action is best developed. He also considers that its action is most marked in a mild or cold climate.

The ill effects reported after the treatment are diarrhœa, nausea and vomiting, and the contra-indications are nephritis and albuminuria. This new drug is a compound of mercury and antimony. In the early part of the 19th century mercury, in the form of calomel, was prescribed in massive doses for the treatment of ague in India with disastrous results in many cases. Antimony in the form of intravenous injections of tartar emetic was advocated by some workers during the war, but later experiments have failed completely to prove that it has any effect in the cure of malaria.

Methods and Treatment.

Since conflicting reports have been made on the efficacy of the treatment of malaria with Smalarina, it was thought that a few carefully observed trials with this drug might evaluate its worth amongst drugs that have been used in the treatment of malaria.

The trials were carried out during the season recommended by Cremonese, namely, September to May, in a hill station in India where reinfection could be excluded. The patients used in the trials were standardised, that is, they were the same as regards physique, age, diet, clothing, housing, mode of life and environment, and were subjected to the same changing conditions of climate. All of them were young British soldiers who had resided in malarious localities for an average period of three years, and all were suffering from chronic relapsing benign tertian malaria.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Procedure.—One tablet of Smalarina was taken on the first day, two on the third, three on the fifth, etc., one additional tablet being taken every other day, until the 31st day when 16 tablets were taken in one dose. The total dosage was 136 tablets in 31 days. Six cases of benign tertian malaria have been treated in this manner. The blood was examined daily in all cases by the thick film method.

Effects of Treatment in Preventing Relapse.

Relapses were diagnosed by the finding of malaria parasites in the peripheral blood by the thick film method of examination, during an observation period of eight weeks after the end of all treatment. Patients who did not relapse during this period were considered as cured.

Amongst the Smalarina cases the average number of previously recorded relapses per patient was 5.7. The spleen rate before treatment was 33.3 per cent.

Six patients were treated with Smalarina, amongst whom relapses due to *P. vivax* were detected in two during the observation period. Of the remaining four patients none relapsed during observation periods of 8, 9, 11 and 13 weeks respectively. The relapse rate for this group was, therefore, 33.3 per cent.

Effects of Smalarina on the Clinical Manifestations.

A. Clinical Cure.—Smalarina is extremely slow in producing a clinical cure in chronic benign tertian malaria. In the two cases that relapsed, it seemed to have no effect whatever on the parasites in the peripheral blood even during treatment. In one of these relapse cases the peripheral blood was examined daily for a period of over four weeks after the end of treatment, and showed malaria parasites fairly constantly throughout this period, while in those four cases which did not relapse after the end of treatment parasites persisted in the peripheral circulation for an average period of 19.5 days during treatment. After the end of Smalarina treatment parasites were absent from the peripheral blood for an average period of 6.8 weeks, reckoning cured cases as 8 weeks only.

B. Temperature.—The average "duration of fever" amongst the Smalarina cases was 3.85 days (maximum 14 days) as compared with 0.29 days (maximum one day) with cinchonidine sulphate and chocolate controls treated at the same time, and as compared with an average of 0.3 days amongst over 400 cases of benign tertian malaria treated at various times with quinine sulphate. No rise of temperature after the commencement of treatment was observed in two cases only. Amongst the Smalarina cases one developed a rigor within 24 hours of the commencement of treatment.

C. Splenic Enlargement.—Amongst the Smalarina cases the spleen was enlarged in two cases before treatment, in five cases at the end of one week's treatment and in two at the end of treatment.

D. Toxic Effects.—No toxic effects were noticed in any of the cases recorded in this paper. The urines of the Smalarina cases were examined at intervals during treatment for albumin, but none was found in any of the cases. Smalarina was perfectly well tolerated in every case.

Conclusions.

As a result of the trial of Smalarina Cremonese in chronic benign tertian malaria, it was found that this drug has little effect in causing the parasites to disappear from the peripheral blood. For this reason patients treated by this method may act as carriers even while treatment is in progress, which is a very serious drawback. The percentage of relapse in these cases was very low, and these results seemed promising, but too few cases were treated to arrive at any definite conclusion in this respect.

The treatment seemed to have little effect on clinical symptoms, nor were its effects on splenic enlargement more marked than those of quinine.

Urea-Stibamine: Its Preparation and Composition.

By SUDHAMOY GHOSH, D.SC., F.R.S.E.,
R. N. CHOPRA, M.A., M.D. (Cantab.),
LIEUTENANT-COLONEL, I.M.S.,
and
NIHAR RANJAN CHATTERJEE, M.SC.

(*The Ind. Journ. Med. Res.*, Vol. XVI, Oct. 1928, p. 461.)

This work was undertaken at the instance of the Indian Research Fund Association who requested us to work out in detail the method of preparation of urea-stibamine and also the approximate cost of its production.

We first attempted to prepare urea-stibamine by closely following the directions given by Brahmachari. We found that, even with great care, the substance could be obtained only in a very poor yield by following these directions.

The preparation involves the following five stages:—(1) Preparation of sodium antimonite; (2) diazotisation of *p*-amino-acetanilide; (3) coupling of the diazo solution with sodium antimonite and the formation of stibacetin; (4) hydrolysis of stibacetin to prepare *p*-amino-phenyl stibinic acid, and (5) combination of *p*-amino-phenyl-stibinic acid with urea.

The processes (1), (2), (3) and (4) are described in Von-Heyden's patents Nos. D.R.P. 254421 and 270488 in Morgan's Organic Compounds of Arsenic and Antimony, pp. 313-315 and Brahmachari's paper, "Further details of the preparation of urea-stibamine," is merely a repetition of the description of Von-Heyden's patents. By following the above processes, a very poor yield is obtained. We have been able to work out certain details by which the yield can be much increased. The time at the disposal of the authors was not, however, sufficient to work out all the conditions for getting the maximum yield of urea-stibamine for commercial purposes. In the last process, viz., the combination of *p*-amino-phenyl-stibinic acid with urea, which is essentially Brahmachari's own discovery, the descriptions are all vague and scanty. It is stated that urea is added to the suspension of *p*-amino-phenyl-stibinic acid in water until the whole is dissolved, but it was found by us that the amount of urea necessary to dissolve the *p*-amino-phenyl-stibinic acid is far in excess of the theoretical amount required by the formula suggested. The constitution suggested has also been adversely criticised by Dr. T. A. Henry as follows:—

"When urea-stibamine was first described in 1922 it was regarded as a salt of urea and *p*-amino-phenyl-stibinic acid having the empirical composition $C_7 H_{12} O_4 N_2 Sb$. Further analysis shows that the formula is correct with the exception that the material contains in addition a molecule of water. Study of the reactions of the substance, however, indicates that it is not a simple salt of the two components as originally supposed, and it is now suggested that in its preparation (which is not described, but appears to involve the heating of urea with *p*-amino-phenyl-stibinic acid) the urea undergoes at least momentary reversion to ammonium cyanate, which then dissociates, the ammonium radicle joining with a hydroxyl group of the stibinic acid residue, while the cyanic acid radicle attaches itself to what was the amino group of the *p*-amino-phenyl-stibinic acid.

Organic chemists will be interested in these singular reactions.

Stibamine, which is the sodium salt of *p*-amino-phenyl-stibinic acid, is now shown to have the trimolecular formula, less two molecules of water, but the author's attempts to write it correctly are not successful. Urea-stibamine and sodium glycyl-*p*-amino-phenyl-stibinate (which it may be explained is amino-stibacetin) do not polymerise."

It is thus doubtful if urea-stibamine is a chemical compound of the type suggested by Brahmachari. It may simply be a complex salt of *p*-amino-phenyl-stibinic acid with urea, having an excess of urea in almost all the commercial samples.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

These considerations led us to carry out further experiments on the nature of urea-stibamine. Samples of different brands of the drug available in the market were procured for our analysis.

Discussion of Results.

Firstly, the extraction with a mixture of alcohol and ether showed that most of the urea could be dissolved out by the solvent. Urea-stibamine, which is said to be practically insoluble in alcohol, should be still less soluble in alcohol and ether and the very high percentage of soluble matter in some of the samples casts serious doubts on their purity.

The residues from the above washings, which were soluble in water, did not agree in composition (as regards N. or Sb.) either with *p*-amino-phenyl-stibinic acid or with the formula suggested for urea-stibamine, and this fact also corroborates our view of the nature of urea-stibamine. The varying results with the residues may be partly due to the fact that *p*-amino-phenyl-stibinic acid or its salt is not carefully purified before it is finally combined with urea.

The estimations of urea by hypobromite also showed wide divergences in the urea content of different samples.

Secondly, the estimations of total nitrogen by combustion showed wide variations. The latest formula suggested should have a nitrogen content of 12.3 per cent. and if we assume that the substance (at least some samples) has been prepared properly and that it is a definite compound, it is difficult to account for the results obtained.

Thirdly, the antimony content has been found to vary in different brands of urea-stibamine from 20 to 43 per cent. whereas the content according to the latest formula suggested is about 35.6 per cent. These unusual variations of the antimony content in the different samples show that there is no standard for this preparation and people may be using samples having nearly 50 per cent. of free urea. Untrained manufacturers will thus soon help to ruin its reputation unless a standard is insisted upon. As there is every reason to believe that antimony (in some form) is responsible for the curative properties of the drug, we are of opinion that a standard should be laid down for the minimum and maximum antimony content of the batches of the drug put on the market.

Conclusions.

(1) The different steps in the preparation of urea-stibamine are given in detail to enable anyone to take up its manufacture. The approximate working cost has also been worked out.

(2) Most of the free urea can be washed out in the cold with a mixture of absolute alcohol and dry ether. The nature of the residue left behind casts serious doubts on the possibility of urea-stibamine being a compound of the nature suggested by its discoverer.

(3) The estimations of nitrogen by combustion show wide divergences in the composition of substances sold as urea-stibamine.

(4) The estimations of the antimony content of various samples on the market show wide variations. As there is every reason to believe that antimony (in some form) is responsible for the curative properties of the drug, it is strongly urged that a standard should be laid down for the maximum and minimum antimony content of the various brands of urea-stibamine offered for sale on the market.

Impressions of the Nature of Pernicious Anæmia in the Light of the newer Knowledge.

By J. H. MEANS, M.D.,

and

WYMAN RICHARDSON, M.D. (Boston).

(*Journ. Amer. Med. Assn.*, Sept. 29, 1928, p. 923.)

MINOT and his collaborators have not only shown how a specific anti-pernicious-anæmia body may be isolated from the liver but have been largely responsible for the idea that this organ contains such a substance as well.

It has been our privilege, since Dr. Minot first told us of the discovery, to observe the effect first of the Minot-Murphy diet, and later of the Cohn-Minot liver extract, in quite a large series of patients with pernicious anæmia in the wards of the Massachusetts General Hospital. Our experience coincides presumably with that of all those who have properly used these methods; namely, that raw liver, cooked liver, or active fractions of liver, or raw or cooked kidney, if given in adequate amounts, cause in practically all cases of pernicious anæmia a rapid remission and restoration to an essentially normal status of blood balance. The improvement is startling and is manifest in a few days in the mental and physical condition of the patient and in the blood picture. Transfusions at their best never effected more dramatic rescues from the brink of the grave than have a few glasses of liver pulp. The characteristic changes that take place in the blood picture are, first, a brief leukocyte rise, then a marked but also brief reticulocyte rise, and finally a steady climb in the red cell count and hæmoglobin to normal levels. There is a tendency for the hæmoglobin to lag behind the red count. We have observed these phenomena now in sixty-five cases. The speed and intensity of the reaction are related to the dose of anti-pernicious-anæmia substance and to the blood level at the start of treatment. As a rule, with raw liver or active fraction, reticulocyte peak occurs between the fourth and the tenth days, and varies between 8 and 56 per cent., with an average of 20 per cent. The rate of red cell increase is from a fourth of a million to a million and a half a week, with an average of 700,000. None of the patients who have continued to take the treatment as prescribed have had a relapse.

The value of liver in promoting blood regeneration in an experimental, chronic anæmia due to blood loss was, of course, proved by the work of Whipple, and it doubtless occurred to many when this work first appeared that a little liver now and then would be a good thing to include in the dietary of the patient with anæmia. Minot, however, took the hint of Whipple's work seriously to heart and went at liver feeding, using large quantities in an entirely scientific manner.

The expectation, in view of Whipple's results, was that liver feeding, if effective at all in human anæmia, would be effective in the secondary type, although Whipple himself stated in 1925 that "even in the complex anæmias (human pernicious anæmia, anæmia with nephritis and cancer cachexia) food factors deserve serious consideration in the clinical management of the blood condition." Minot also for some years had had certain notions about the possible rôle of dietary errors in the genesis of pernicious anæmia. These were stimulated, in part at least, by an opinion expressed to him by the late Dr. J. H. Wright, that the primary lesion of pernicious anæmia was in the marrow, and that it resembled a tumour. This led Minot to look elsewhere than in the increased blood destruction for the cause of the disease. The difficulty seemed to lie rather in the failure of the red cell elements to undergo normal maturation. This raised the question of growth promoting factors, and the work of E. V. McCallum, together with certain symptomatic resemblances between sprue, pellagra and pernicious anæmia, the already known beneficial effects of liver soup in the first of these, and finally, Whipple's work all served to focus Minot's attention on liver. Most fortunately, therefore, when he began his intensive liver feeding he included patients with pernicious as well as secondary anæmia. And then the miracle occurred, the reverse of what most persons would have expected: namely, that whereas the patients with secondary anæmia showed an improvement slow and uncertain, those with pernicious anæmia, without exception, showed a rapid and certain one. The response was no less dramatic than that evoked by thyroid in myxœdema, orange juice in scurvy, pituitary in diabetes insipidus, or insulin in diabetes mellitus. By analogy, the conclusion was inescapable that in liver there occurs a substance quite as specific in its effects as are any of the known vitamins or autacoids, the lack

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of which in sufficient quantity or form is responsible for most of the manifestations and derangements found in the syndrome called pernicious anæmia. The subsequent isolation of such a body in relatively pure form by Cohn proves that this conclusion was correct.

The question now becomes: What does all this tell us about the nature of pernicious anæmia? It would seem fair to assume, in view of the new facts, that pernicious anæmia is in some sense or other a deficiency disease rather than an infectious, toxic or neoplastic one, as had previously been supposed; but it seems doubtful whether pernicious anæmia bears more than a slight resemblance to any of the other deficiencies with which we are familiar.

In the first place, it is clear that it is not a simple avitaminosis like scurvy or beri-beri. It can be shown that the effect of the active liver fractions is not due to any of the known vitamins; but that is not the important point, because it might of course be a new vitamin. The relation of the specific substance to the disease, however, is by no means as simple as in the case of the known avitaminoses. A sufficient shortage of any of the known vitamins will produce the characteristic deficiency syndrome in any previously normal individual. Many persons, however, in fact, most, live habitually on diets which contain an amount of the specific substance quite inadequate to relieve or maintain in normal blood balance a patient with pernicious anæmia, and yet they never develop that disease. One is forced to conclude, therefore, that the appearance of the disease is not due solely to an external shortage of a specific substance necessary to normal life. There must be in persons who develop pernicious anæmia on what would be an adequate diet for the majority of mankind either some internal obstacle to the acquisition of the specific substance or, because of some pre-existing abnormality, an exaggerated requirement for that specific substance. In other words, for the production of the disease it seems likely that there needs must be something wrong with the individual, an hereditary or acquired defect, as well as something wrong with his dietary.

To date, nothing is known of the synthesis of the specific substance. It is found in mammalian liver and kidney, and apparently in avian liver as well. Thus far it has not been discovered in plants, and unless vegetable sources are subsequently found, we are forced to conclude that some animals, at least all such as can live strictly vegetarian existences, are capable of carrying out its synthesis. Whether the human being usually manufactures the whole or a part of the needed amount of the specific substance, or whether he ordinarily derives it all from his food supply, we do not know. If the former, pernicious anæmia might be considered analogous to myxœdema, the requirement for an abnormally large intake of the specific substance being due to a failure of internal production. The eating of liver then would relieve pernicious anæmia precisely as thyroid relieves myxœdema. But such a relationship we can hardly conceive as being the case. For one thing, the known autacoids are manufactured probably each by a single tissue, the parenchyma of one of the several endocrine glands. The anti-pernicious-anæmia body certainly cannot be regarded as an internal secretion of the liver when it occurs in nearly as great concentration in a tissue so different as the kidney. Insulin, to be sure, is found in a variety of tissues, but in very small amounts as compared with the pancreas, and there is good reason to believe that it is made in no other place than in the pancreas. But as to the question of what tissue synthesizes the anti-pernicious-anæmia substance, we are in the dark.

Important evidence bearing on the problem has been provided by the recent work of Castle. This investigator was loath, on the discovery of the specific substance, to abandon the idea that the well-known achylia had some part to play in the genesis of the disease—a deficiency disease, to be sure, but the deficiency due perhaps to a defect in protein splitting dependent on the achylia. Working on this hypothesis, he showed that a response similar to that obtained from feeding liver could be elicited in the majority of patients with pernicious anæmia studied, by the feeding of skeletal muscle previously digested in a normal human stomach. This relation would be without effect except when subjected to such preliminary treatment. This finding, of course, suggests that the shortage of specific substance, from which the patient with pernicious anæmia suffers, depends rather on his lack of digestive ability than on a failure to manufacture the substance within his tissues, or that a failure of internal manufacture is due to a failure in gastric digestion which must precede it, in order perhaps to supply certain elements necessary to its synthesis. It is conceivable, perhaps, that the person with normal digestive powers can derive from the products of digestion the wherewithal to manufacture the required substance, but that without such digestion it can be obtained by ingestion preformed; and it might be fair to conclude that in the patient with pernicious anæmia there is an obstacle to the provision of the required amount of the specific substance surmountable by providing either (*a*) an adequate supply of the preformed substance in the food, or (*b*) a type of digestion by which it, or substances from which it can be made, can be extracted from an ordinary diet.

These various discoveries, therefore, of Whipple, Minot, Cohn and Castle constitute a colossal advance; yet even so we are still ignorant of the cause of pernicious anæmia. One of its features which is by no means entirely clarified by the newer knowledge is the intermittent course. Diseases based on dietary insufficiencies, such as pellagra or rickets, may be intermittent, but in these the ups and downs can be directly traced to alterations in the diet or to the amount of exposure to sunlight. Chronic infections are characteristically intermittent, but the infectious theory of pernicious anæmia is exploded. Allergic phenomena are intermittent, but it will hardly do at the moment to suggest that pernicious anæmia is a form of allergy. Of course, it is possible that infection and diet may play an important rôle in determining the fluctuations in the severity of the disease. We are familiar with the depressing effect of infection on sugar burning capacity in diabetes. It is possible that the upsetting of an extremely unstable balance between blood formation and destruction by either infection or diet change is responsible for the so-called spontaneous remissions and relapses.

Further study is indicated along the lines of both the nature of pernicious anæmia and the biologic and pharmacologic properties of the specific substance. These two lines are by no means identical. That the supply of the specific substance is not the whole story in pernicious anæmia is conceded; that the specific substance has an effect on the human organism other than to hold in abeyance the manifestations of pernicious anæmia is also now proved. For example, it is effective in anæmias other than pernicious but which resemble it; namely, that of fish tapeworm infestation and that of sprue. It also, according to Sabin, accelerates the proliferation of the primitive red cells of the chicken embryo, and, according to Berglund, increases the number of circulating erythrocytes in normal human beings. Whether the substance that is fed is the final product, or whether it is a precursor of the substance the organism finally needs, should be investigated. A comparison of its effects after parenteral administration with those of enteral administration may further clarify the problem. The substance as now isolated appears to be either a nitrogenous base or a simple polypeptide. The methods for studying the substance are more abundant and obvious than those for studying the disease. Light may be shed on the latter by a careful comparison with other chronic diseases of unknown etiology that run an intermittent course.

From present-day evidence, then, we would conclude that:

1. Pernicious anæmia is a chronic disease of unknown etiology, the chief manifestations of which can be held in abeyance so long as adequate amounts of a specific substance, contained abundantly in liver and kidney, are received.

2. The supply of this substance can be rendered adequate in persons suffering from the disease by feeding large quantities of natural foods which contain it (liver or kidney), or active fractions thereof, or perhaps also

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

through the provision of the means for normal gastric digestion.

3. Shortage of the specific substance is clearly responsible for the abnormalities in the marrow and the blood. The cause of the shortage is not completely known. Castle's work suggests that the gastric defect may play an important rôle.

4. Whether the normal human being requires any extraneous supply of the specific substance or can synthesize what he needs is not yet known. The problem of whether the active substance now found is in the state that the body needs or is merely a necessary building stone, also remains unsolved.

The Modern Treatment of Varicose Veins.

By G. H. COLT, M.A., M.B., B.Ch. (Cantab.), F.R.C.S.

(*Brit. Med. Journ.*, September 22, 1928, p. 525.)

THE passing of the operative treatment of varicose veins may be regarded as a merciful release for the surgeon, but a tribute is due to those who made the modern operative treatment eminently effective in male, and on the whole fairly effective in female, subjects, and so led directly to the success of the injection treatment.

CLINICAL PATHOLOGY OF THE INJECTION METHOD.

There seems to be a general agreement among those who have examined the veins after injection with various solutions that for about the first hour there is no naked-eye change in the endothelium. The vein contracts, and the walls may stick together, giving a splendid result surgically. With some solutions sudden clotting occurs, resulting later in a thick fibrous cord, which takes months to disappear. Gradual thrombosis allows the excess of blood to be slowly removed, and this, surgically speaking, is greatly to be preferred. In twenty-four hours the endothelium is tumefied, and there may or may not be infiltration and peripheral clot. The clot, when formed, is always firmly adherent from the start. In one of V. Meisen's cases it was not separated by strong massage, which is comparable with the degree of molecular adhesion found between an aseptic clot and a piece of dull-gilt wire inserted into an aneurysm. The clot in this case in the recent state has actually to be scraped off the wire. In forty-eight hours the vein is still contracted, the endothelium swollen and covered with fibrinous deposits. In seventy-two hours the endothelium is proliferating strongly. In a week the clot is undergoing organization and the lumen of the vein is greatly narrowed. At this stage one can gauge fairly accurately the most suitable site for the next injection. In a fortnight the clot is well organized. Later it does not soften or degenerate, but becomes a firm fibrous cord. Sir Sidney Alexander suggests that the term "chemosis of the intima" would be better than "endovenitis." The vein may die, the tissues around it may necrose. Both remain aseptic if protected from infection, the dead tissue forming a scab which separates in about six weeks and leaves a slowly healing ulcer; or healing may take place under the scab.

VARIATIONS IN THE EFFECTS.

Douthwaite states that the thrombosis produced by the quinine solution does not spread rapidly, as it may do with the salicylate solution, and that the risk of persistent ulceration from faulty injection is less. Hanschell's experience differs from this, and Hepworth noticed phlebitis extending downwards from the site of injection. Sometimes the walls of the vein adhere at once with immediate and permanent obliteration of the channel; sometimes there is an extensive reaction in both directions from the site of puncture; sometimes no reaction occurs at all, and yet on repeating the injection a week later in the same way a marked reaction occurs. There is, therefore, little doubt that the chief variables—namely, the blood volume and blood current at the site of injection—have a great effect. We know that in a horizontal varicose vein the blood may be moving slowly in either direction, or that it may be stagnant. In the vertical position, or even raised 45 degrees, the circulation is centrifugal. These facts have been confirmed radiographically. We do not know, and apparently have no certain means of finding out the effect, at any given moment, of the anastomoses close to our point of injection. Although most of those who practise the treatment try to empty the vein of blood after the needle is in the lumen and before making the injection, so as to bathe the endothelium with the concentrated drug, and then either let the patient lie or stand a few minutes, or a pad and bandage is applied, they have no sure knowledge that the injection has not gone quickly into a deeper loop of vein or been rapidly diluted by blood from another channel. It seems to me unnecessary to blame the keeping properties of a solution when these other obvious variables are present. These variables also help to explain the excellence of the results in general, because the injection reaches, though doubtless in a less concentrated form, the smaller tributaries, and especially the anastomotic and perforating branches which join the deep veins. At that moment the dilution becomes excessive. The respiratory change noticed by Barber may also be intimately related to the matter. That we have not got the whole truth yet is also clear from the case recorded by Wilson of the disappearance of a group of varicose veins below the knee six weeks after six punctures had been made for the withdrawal of blood. Sir William Bennett recorded six cases of the spontaneous disappearance of large varicoceles after injury to them. Both these observations are interesting also in view of the treatment of aneurysm by scratching the inner wall of the sac with a needle, for in such cases the amount of clot formed has been minimal or nil, and no embolism has ever occurred in the absence of sepsis.

The danger of embolism in aseptic cases of varix treated by injection is evidently very small.

A few cases showing various untoward symptoms have been reported and still fewer in which death from embolism occurred.

RESULTS OF THE INJECTION TREATMENT.

It is quite common now to obtain an almost complete obliteration of a valveless internal saphena system after one injection. The procedure is as follows:—

The patient stands on a chair near a table and a single band tourniquet is lightly applied around the upper part of the thigh, to help to prevent the veins from emptying too rapidly during recumbency. The patient then lies down on the table and the vein is entered, preferably above the knee or in the main trunk below the knee; the tourniquet is loosened, the vein is emptied of blood near the needle, and a finger is placed on it above the middle of the thigh; 2 to 6 c.cm., according to the size of the veins, of 30 per cent. sodium salicylate, with 10 per cent. sodium chloride solution (P. D. and Co.), are injected, preferably towards the groin; the limb is elevated to 30 degrees for three seconds, and then the patient rises slowly and stands on the chair. The finger is removed and the charge of solution sweeps downwards into the saphena system. This is painful for half a minute. The patient describes the pain as continuous and stinging, or as cutting, lancinating, or cramplike, and feels it travelling down the leg to the foot. These omens are favourable. By letting the patient lie down at this stage and again elevating the limb for a few seconds the solution may perhaps be tipped back again or kept a little longer in the saphena. Active muscular movement at once sucks the solution away and dilutes it rapidly. No bad effect has been noticed. Sometimes the solution must miss outlying varicose groups because these may require separate injections a week or a fortnight later, when the effect of the first injection has become manifest. At this time also the external saphena system, or the large anastomotic vein from the external to the internal system, which is often present in front, below, or above or behind the knee, may be injected. A week after the first injection the internal saphena system is generally hardening from the middle of the thigh to the lower third of the leg. Exceptions seem to be explicable by the well-known common sites of the chief deep anastomosing channels which dilute the solution,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Taken as a whole this method has answered very well and seems to me to be better than beginning at the distal radicles and working against gravity with multiple injections. The results have been as follows:—

In the first seventeen limbs sixty injections, each of seldom more than 3 c.cm., were used, and one small scab formed. In the next twenty limbs only forty-seven injections were required of 4 to 6 c.cm., seven of which were in a limb in which the excessive blood volume diluted the solution quickly. Three small scabs formed in these limbs. In nearly all the limbs the degree of varicosity was marked and there was an impulse to the ankle on coughing. Tiredness, weight, fullness, and cramp had been the chief symptoms.

In one limb with a vein of small blood volume an injection of 2 c.cm. was sufficient to cure. In one with a large blood volume one of 6½ c.cm. cured. In three limbs with large blood volumes one 5 c.cm. injection cured in each case. In one case an injection of 6 c.cm. cured the internal saphena, and one of 3 c.cm. the external. In another case an injection of 6 c.cm. (and 5 c.cm. for a large cyst) cured. In one instance the walls of an anastomotic vein stuck together with no sign of thrombosis after the introduction of 2½ c.cm. In two cases with large blood volume injections of 5 c.cm. above the knee and 5 c.cm. near the ankle resulted in cure. In one case injections of 6½ c.cm. and 5 c.cm. cured, and in another instance the introduction of 5 c.cm. and 3 c.cm. cured the condition. By cured is meant that the whole of the visible internal saphena system, which was the one chiefly involved, became thrombosed in a week or a fortnight from the middle of the thigh to near the ankle, and that in five weeks there was, for practical purposes, no sign or symptom of the disease.

These results show clearly that the hydrostatic principles of Trendelenburg (Brodie) and the operative indications of Jeannel are the lines along which the injection method should be practised when using salicylate-saline solution. Whether this method is possible with smaller injections such as with the quinine solution, or not, remains to be settled. The larger volume of the salicylate-saline solution is certainly more manageable in this respect and is yielding the results with negligible risk and little inconvenience; results which are so much better than were possible by laborious and somewhat risky operations that operation seems to be no longer justifiable except in certain very isolated cases.

A Fallacy in the "Heat and Acetic Acid Test" for Albumin in Urine.

By H. D. BARNES, B.SC.

(*Journ. Med. Assn. of South Africa* (*B. M. A.*), October 13, 1928, p. 522.)

As this test has been established for many years, it would seem impossible for anything further to be said regarding it; nevertheless, a point has arisen in my experience which is either not mentioned or is inadequately stressed in text-books.

For the sake of its rapidity, combined with a high sensitivity, the "heat and acetic acid" test is used as a routine qualitative test in this laboratory.

The urine if turbid is shaken with a knife-point of siliceous (Fuller's) earth and filtered; the filtrate is invariably perfectly clear, and very faint traces of albumin can therefore be detected. The clear urine is then heated to boiling in a test-tube, and one drop of 50 per cent. acetic acid added. In case of doubt comparison with a similar tube containing unboiled urine is a considerable help.

In acid urines no difficulty is experienced—the protein is precipitated before the addition of the acid, which merely causes flocculation of the precipitate. If, however, the urine be amphoteric in reaction, the cloudiness obtained on heating is due to phosphates, and redissolves on the addition of the acid. It is at this stage that due caution must be exercised, as the presence of albumin is liable to be overlooked. If several drops of acid are added directly to the hot urine, appreciable quantities of albumin, even though precipitated momentarily, redissolve and so evade detection. This is much more strikingly shown if, in addition to the amphoteric reaction, the specific gravity of the urine be low (1010 or less). In these circumstances, as much albumin as would be reported as a "definite trace" has frequently been observed to redissolve, and give a result which would confidently be reported as negative.

When one considers that the diet recommended to nephritic subjects—liquids and a minimum of protein—is just the one to produce a dilute urine of low acidity, the importance of this point will be realized.

In such books as do note the re-solution of albumin, no mention is made of the fact that it is more pronounced in amphoteric urines. Deficiency of salts is taken to account for the occurrence and addition of strong salt solution suggested in order to overcome the difficulty. Sometimes, however, it is recommended that the urine be made acid before boiling. This procedure is rather to be deprecated, as I consider the disappearance of the phosphates an invaluable check on the quantity of acid required. In passing, it may be noted that these books are usually of the exhaustive type, and not the ones in general use.

To my mind, the simplest means of avoiding this fallacy is to incline the test-tube after boiling, and allow one drop of the acetic acid (which need not be diluted more than 50 per cent.) to fall on the side, and flow slowly into the urine, whilst shaking gently. By this means the acidity of the urine is slowly increased, the precipitate of phosphates is dissolved, after which the milkiness due to the formation of insoluble albumin slowly appears. The addition in similar manner of a second drop of acid sometimes causes an increase in the turbidity, and is necessary to bring about the complete change, when the original reaction was towards the alkaline side.

It is a safe rule to add drops of acid in the manner described until the phosphates have dissolved and then one drop more. If the urine then remains quite clear, it may be concluded that no albumin is present. The whole process should not occupy so much time that the contents of the tube have cooled below the temperature at which albumin is coagulated. Moreover, when the reaction of the urine is strongly alkaline it is advisable to determine, by means of litmus paper, if sufficient acid has been added. Should the reaction still be alkaline, the addition of acid must be continued until a slightly acid reaction is obtained before drawing any conclusions as to the presence or absence of albumin.

Uncommon Ill Effects of Salvarsan Treatment.

By J. O'DONOVAN, M.D.

(*Brit. Med. Journ.*, October 27, 1928, p. 742.)

FATALITIES from salvarsan therapy do not stand in the front of the minds of the present generation of venereal specialists as they did amongst those who first used this drug with trepidation, and hope, in 1911. For when the arsenobenzols were originally introduced their use became associated with a formidable list of ill effects.

Experience has not demonstrated any certain method by which the type of patient unsuitable for salvarsan therapy can be picked out and treated in other ways; neither old age, aneurysm, phthisis, chronic Bright's disease, high blood pressure, nor severe valvular disease of the heart can, in themselves, be considered as contra-indications to its use. Ill effects may follow the administration of small doses, they may occur at the beginning, at the middle, or at the completion of a full course of salvarsan treatment. No brand of manufacture seems to be exempt, though at times a run of toxic effects from the use of any one make compels the physician for expediency to omit this temporarily from his armamentarium It would be wrong to say that these remedies are safe remedies, though I would be the last to express anything but gratitude for their invention.

Dr. E. T. Burke has recently published a treatment of venereal disease (1927), in which four and a half pages are given on untoward effects of salvarsan therapy. The ill effects there referred to are:

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"Headache, shivering, vomiting, dyspnœa, palpitation, fainting, and so on. During the actual injection there may be nausea, and vomiting, a feeling of fullness in the throat, a huskiness in the voice; the face may become flushed and the conjunctivæ injected. At times there are severe cramps in the limbs and abdomen, diarrhœa and cardiac distress, and in many of such cases there is undoubtedly a psychological factor at work."

After these immediate reactions Dr. Burke records an intermediate type of general or local urticaria or an œdema of the face and hands. Hæmorrhagic encephalitis is included in this group, which may be rapidly fatal. He states that it seems to occur most frequently among alcoholics. I have seen but one case, and it occurred in an abstemious primipara.

Under the title "delayed reactions" he refers to "exfoliative dermatitis most prone to occur in neurotic patients." Jaundice is the other and last-mentioned untoward effect. This record might, I think, be fairly considered as a minimizing report when contrasted with the following two accounts. The list collated and published by the Salvarsan Committee of the Medical Research Council in 1922 recorded cases of urticaria, discrete erythema, papular erythema, exfoliative dermatitis, pemphigoid eruption, Raynaud's syndrome with gangrene, and purpura, as toxic effects following the employment of arsenobenzol preparations. Mouradian published an appalling list of "accidents." These included cases of intestinal paralysis, serious uterine hæmorrhage, choleriform diarrhœa, cephalalgia with migraine, epileptiform convulsions with sensorimotor troubles, febrile icterus, epistaxis, and hæmaturia followed by anuria.

The cases recorded below are outside this list and are of interest because of their gravity and apparent rarity. I feel certain that many cases are lost sight of through the dissociation of clinics from general hospitals or because such ill effects are delayed and the practitioner in attendance is not in touch with the salvarsan administrator.

CASE I.—*Post-salvarsan Melanodermia.*

A dark, well-built man of 50 was infected with syphilis when 17, and was treated then with caustic to the sore and six months' medicine. In 1923 his Wassermann reaction was positive, and he received eleven doses of neosalvarsan between the end of December, 1923, and the middle of January, 1924, from a competent private doctor. After the eleventh injection his skin became so uncomfortable that he changed his doctor. He was sent into the London Hospital on July 1st, 1924, with general erythrodermia and free generalized exfoliation. A differential blood count showed: stained blood leucocytes 14,300 per c mm., polynuclear neutrophils 80.5 per cent., polynuclear eosinophils 2 per cent., small lymphocytes 5 per cent., large lymphocytes 5 per cent., large hyaline cells 8.5 per cent.

By September 18th the exfoliation and redness had disappeared; the patient's skin was smooth but deeply pigmented, as dark as an Indian's: most uniform in the large flexures, but elsewhere on the trunk and limbs were numerous small circular areas of sharply defined white skin.

This condition has been vaguely recorded by two French writers, Goulay and Bouteillier; Goulay says that arsenobenzol erythrodermia leaves some kind of melanodermia, and Bouteillier contrasts the great frequency of exfoliative erythrodermia with the rarity of melanodermia and keratodermia. (See Case II.)

CASE II.—*Post-salvarsan Maculo-melanodermia with Follicular Hyperkeratosis.*

An unmarried French-polisher, aged 26, came to the London Hospital in June, 1927, with a primary syphilitic sore of six weeks' duration, together with inguinal adenitis and a faint macular eruption on the thorax. The Wassermann reaction was positive. He was treated with seven weekly injections of neo-kharsivan, one of 0.6 and six of 0.9 gram. Two weeks after the last injection both legs were red and swollen. He stayed at home until December 19th, giving a history that he had become red, had skinned all over, and had lost a good deal of his hair. There was now a startling dappled appearance of the skin of his trunk, neck, and upper limbs, due to a macular, non-infiltrated deposit of brownish-black small ovals of pigment. There was no generalized adenitis, no relapse of the primary sore, but over the trunk, thighs, and arms, both in front and behind, was a most profuse development of projecting small uncoloured horny spines protruding from uninflamed pilo-sebaceous orifices. He was admitted to the London Hospital on January 2nd, 1928; since then a very few spines have become reddened, many have developed blackened tips and can be expressed like hardened comedones; in addition, he has developed a moist eczematous plaque on his right wrist, and a small, infiltrated, pink, slightly itching eruption of the right anterior axillary fold.

There are now no condylomata, no buccal lesions, or pigmentation. The patient feels thoroughly well and has a negative Wassermann reaction. There is no arsenic in the urine and no albumin; the total and differential blood counts show no abnormality.

CASE III.—*Multiple Subcutaneous Abscesses Associated with Arsenical Exfoliative Dermatitis.*

A woman, aged 32, attended my clinic at the London Hospital in February, 1927, with a primary sore and several secondary skin lesions. The Wassermann reaction was positive. She was given an intravenous injection of 0.6 gram of neosalvarsan on February 27th, and this was repeated on March 6th, 13th, and 27th.

On April 4th, the patient developed an irritating generalized morbilliform rash, and was given sodium thiosulphate intravenously. She was admitted into hospital. The whole skin gradually became uniformly more thickened, moist, and weeping in the flexures, cracked and scaling elsewhere. There was an abnormal enlargement of glands. There was profuse diarrhœa with occasional blood in the stools, the temperature ranging between 99° and 102° F. The output of urine at times fell below 20 oz. per diem and showed albumin. The patient lay supine in bed in a typhoid state.

During this time a great number of subcutaneous abscesses developed, resembling the "cold abscesses" of tuberculous infections in that there was an absence of any surrounding inflammatory reaction. Over forty of these abscesses were opened, one to two egg-cupfuls of thick blood-stained pus being evacuated from each. Cultures from this pus showed the presence of *Staphylococcus aureus*. This phase extended over three weeks.

Towards the end of May, the patient's condition began steadily to improve, the thickening of the skin diminished, the fissuring and exfoliation abated, and no new abscesses were formed. There was no shedding of hair or nails. On June 12th, she was able to walk unaided; there was only slight scaling of the limbs and round the orbits, and the patient's general condition was sufficiently good to allow of her discharge from the ward, she having rapidly and steadily gained weight. Her appetite remained good throughout the illness, in spite of the fact that on more than one occasion recovery seemed a remote possibility.

CASE IV.—*Cutaneous and Subcutaneous Necroses, Perforation of the Nasal Septum with Arsenical Exfoliative Dermatitis.*

A man, aged 42, a caretaker, had a primary penile sore and generalized rash in 1908, and was treated, when in the navy, with thirteen mercurial injections. His Wassermann reaction was negative in 1920.

On August 16th, 1927, he attended the syphilis clinic of the London Hospital, with a well-defined ulcer on the right leg. The Wassermann reaction was weakly positive. He had four injections of neo-kharsivan, 0.9 gram, at weekly intervals. Six days after the last injection the eyes became puffy, and he developed a universal lividity of the skin. He was admitted into the ward on October 3rd, and treated at once with intravenous sodium thiosulphate. He showed a generalized erythema, puffy face, swollen limbs, and temperature rising daily from 98° to 104° F. in a fortnight. There was no enlargement of the spleen; no bradycardia. The urine showed a trace of albumin; no sugar; deposit—few leucocytes,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"TRADE MARK NORMACOL" BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

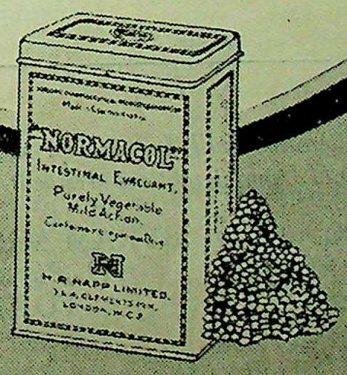
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H.R.NAPP LIMITED,

3 & 4, Clements Inn, London, W.C.2.

Telegrams: "NAPPCHEN LONDON." Telephone: HOLBORN 1444 (Two Lines).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

RADIO-MALT

Its content of Vitamin A

(The anti-infective Vitamin)

Vitamin therapy is less the outcome of one brilliant discovery than the evolution of one scientific problem by the combined research of many workers—and the process of evolution still goes on.

Recent work (*B.M.J., Oct. 20, 1928, p. 695,*) establishes beyond doubt that—"although Vitamin D controls, probably absolutely, the calcification of bones and teeth, it has no direct power to promote resistance to infection in the same way as Vitamin A."

It is on account of its power to give resistance to infection that Vitamin A is important.

Radio-Malt contains all three Vitamins A, B and D, in a form most suitable for everyday use.

The Vitamin A contained in Radio-Malt is extracted from a new source by a process discovered and developed in the B.D.H. laboratories. The Vitamin A is mixed with an accurately-calculated quantity of Radiostol (Vitamin D), and the resultant mixture is combined with Vitamin B extracted in the B.D.H. laboratories from a seed germ; this concentrate of the three Vitamins A, B and D, is then added to extract of malt which itself contains Vitamin B.

Radio-Malt thus contains all three Vitamins A, B and D—all scientifically-harmonised and accurately-standardised by physiological tests. It is made by the most up-to-date machinery, and from first to last in no part of the process is the product or any one of its ingredients handled at all.

Descriptive literature will be sent on request to either of the B.D.H. representatives resident in India :—

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
119, Parsee Bazar Street,
FORT, BOMBAY, No. 1.

THE BRITISH DRUG HOUSES LTD.
LONDON

Vit.Pr./In/292

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

epithelial cells, and amorphous urates. No tubercle bacilli were found. Culture showed the presence of *B. proteus.*

Blood examination on October 13th showed stained blood leucocytes 30,000 per c.mm., polynuclear neutrophils 48 per cent., polynuclear eosinophils 41.5 per cent., small lymphocytes 7 per cent., large lymphocytes 1 per cent., large hyaline cells 2.5 per cent.

On November 7th, the patient developed an acute abscess of the neck. A probe was introduced and passed between the skin and the structures of the neck for three inches on the right side. In addition there were gangrenous sloughs on his back and right heel. The nasal septum perforated. The previous day the heel and back were in perfect order. A radiogram taken on December 22nd showed necrosis of the bone of the os calcis. At this time both legs were markedly pigmented. The patient was discharged well on January 3rd, 1928.

CASE V.—*Pulmonary Embolism.*

This man was first seen on January 21st, 1927, with a primary syphilitic sore. He was treated at the London Hospital with seven weekly injections of novarsenobillon; the last six doses were 0.9 gram. Early in March, he had some irritation of the neck, which he treated with iodine, and on March 6th, he was admitted with exfoliative dermatitis. He became extremely ill with high fever, delirium, and albuminuria; he recovered from this, but his nasal septum perforated. On April 7th, he complained of small boils in the left axilla and right groin. I examined him at 2 p.m. on April 12th, when he seemed fairly well, able to sit up in bed unassisted, tongue moist, pulse 80, regular, and exfoliation confined to the scalp, palms, and feet. At 10 o'clock that night he complained of distress in his chest, he became unconscious, cyanotic, and died within five minutes. No post-mortem examination was permitted, but the symptoms were sufficiently definite of pulmonary embolism from a clot dislodged from the iliac veins.

I have recorded uncommon but important ill effects following the administration of salvarsan remedies for syphilis. The knowledge of these possibilities makes it important that no practitioner should undertake the intravenous salvarsan therapy of syphilis without having facilities for immediate transference of his patients from an ambulatory clinic to a ward. The knowledge of these possibilities must be brought before the attention of the public if public support is to be sought for the compulsory treatment of venereal disease. Otherwise, there will arise a feeling of resentment among the uninstructed should a severe accident or a fatality follow the compulsory administration of these most important but toxic remedies.

Reviews.

HANDBOOK OF PHYSIOLOGY.—By W. D. Halliburton, M.D., LL.D., F.R.C.P., F.R.S. and R. G. S. McDowall, M.B., D.Sc., F.R.C.P. London: John Murray, 1928. Eighteenth Edition. Pp. 902. Illustrated. Price, 18s. net.

PROFESSOR Halliburton's is probably the most famous of all text-books on physiology. It started life in 1848, the original author being Dr. William Senhouse Kirkes, of St. Bartholomews Hospital, and it was associated with this great medical school from this date until 1896, when the editorship was taken over by Professor Halliburton. In the 32 years during which he has been associated with it the book has gone through eighteen editions and of the first seventeen editions one lakh sixteen thousand copies were sold. Professor Halliburton has now retired from his post at King's College and he has received the help of his successor in the revision and in the production of this most recent edition. The advances which our knowledge of the subject of physiology is at present undergoing are very great, but the complete re-writing of the book—in the sense that it was re-written by Professor Halliburton thirty-two years ago—is never likely to be necessary, so we hope that, even when he retires from active editorship, his name will be still associated with the title.

The chapter on the nervous system has been re-written and additional information has been given on the subject of the formation of the blood and bile, on blood groups, and on test meals and the polygraph. Recent work on the spleen, on the control of respiration, and on various other matters has been included. To add to a book of this nature, in view of the additions to our knowledge during recent years, is no great achievement, but to cut out unessential matter without impairing the value of the book requires the hand of the master. The present editors have succeeded in this so well that they have actually reduced the size of the book.

We cannot allow the part that the publishers have played to pass unnoticed. The print is large and easy to read, the illustrations and plates are very well produced, yet the book with its nine hundred pages does not form a bulky volume and the price is absurdly low.

It is the text-book *par excellence* for the pre- or post-graduate student.

L. E. N.

DE LAMAR LECTURES. 1926-1927. (The Johns Hopkins University School of Hygiene and Public Health).—By Several Authors. Baltimore: The Williams and Wilkins Co. English Agents: Baillière, Tindall and Cox, London, 1928. Pp. 224. Price, 22s. 6d. net.

A SERIES of popular lectures on personal and public hygiene is arranged each session by the school of hygiene and public health of The Johns Hopkins University.

The object of these lectures is to bring before the public the general facts and points of view of modern hygiene, with the hope that in this way the school may serve as a centre for the distribution of useful knowledge in all matters pertaining to sanitation and preventive medicine.

These lectures are supported from the fund bequeathed to the Medical School by Joseph R. De Lamar, in accordance with the wish expressed in his will "to give to the people of the United States generally the benefits of increased knowledge concerning the prevention of sickness and disease, and also concerning the conservation of health by proper food and diet."

This volume includes the lectures given in the sixth series, during the session 1926-1927, at the school of hygiene and public health.

The lecturers include Professor F. Neufeld of Berlin and Professor Nuttall of Cambridge. The lectures are all on subjects of considerable interest; that on tularæmia constitutes a valuable review of the discovery and of our present knowledge of this disease. The format is of the quality which we usually associate with the name of this well-known firm of publishers.

ERYTHEMA NODOSUM.—By J. O. Symes, M.D. Bristol: John Wright and Sons, 1928. Pp. 72, with illustrations. Price, 5s. net.

THIS is an interesting little monograph on a disease which is rare in this country. The author states that he has not burdened the text with innumerable references to other writers but has written the book mainly round his own experience. This, we think, is a pity. Usually the most valuable part of a monograph is its bibliography; the experience and opinions of a single writer are more suitably expressed as contributions to medical journals. The main theme of this book is the association of tuberculosis and erythema nodosum. One of the strongest arguments against this theory—but in favour of the opposing theory, the association with rheumatism—is the rarity of the disease in India and many other tropical countries where tuberculosis is common. This is an argument which immediately sprang to our minds and we find that the author has admitted it. We are not

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

entirely convinced by the arguments, but as he is not dogmatic, one put the book down without feeling that one had any quarrel with the writer.

The binding, printing and paper are excellent, and the book will be much appreciated by those interested in the subject.

L. E. N.

AIDS TO PSYCHIATRY.—By W. S. Dawson, M.A., M.D. (Oxon.), M.R.C.P. (Lond.), D.T.M. Second Edition. London: Baillière, Tindall and Cox, 1928. Pp. vii plus 312. Price, 4s. 6d. net.

THIS little book, one of the now extensive range of small volumes comprising the "Aids" series, appears to fulfil a useful function if its limitations are realised. It is not intended to serve as a text-book of psychiatry; it should be used as a source of quick revision only after a firm grasp of the subject has been obtained by a study of the larger standard works.

The book may be divided into four sections, (1) normal psychology, (2) psycho-pathology, (3) the neuroses and psychoses—including mental deficiency, (4) a concluding section dealing with the legal aspects of insanity, and with case taking, and mental hygiene.

In the chapter entitled "Theories of the Neuroses" the teachings of Freud and of Jung are briefly dealt with. (In parenthesis, the statement on p. 110 that successful sublimation of sadistic tendencies "leads to a career as a soldier, surgeon or butcher" is probably true but the juxtaposition is surely a little unfortunate.)

Dr. Dawson's estimate of the value of psycho-analysis as a therapeutic measure is definitely conservative: it "has proved of use in the neuroses such as hysteria and the obsessional neurosis where other methods have failed. In the psychoses the procedure is more of interest than of use as a therapeutic measure although some improvement may be effected in delusional states such as paraphrenia."

It is rather surprising to find that the author describes only the subcutaneous injection of infected blood as a means of inducing malaria in the treatment of general paralysis of the insane. No reference is made to the use of infected mosquitoes, which we understand to be the method of choice at the present day—at least in England.

The book is of handy size, the printing is good, there is an adequate index and the price is very reasonable.

J. M. H.

GYNÆCOLOGY.—By W. P. Graves, A.B., M.D., F.A.C.S. Fourth Edition. Thoroughly Revised. Philadelphia and London: W. B. Saunders Company, 1928. Pp. 1,016, with 408 half-tone and pen drawings by the author, and 153 microscopic drawings by Margaret Concree and Ruth Huestis, 128 of the illustrations in colours. Price, 48s. net.

THE fourth edition of Graves' Gynæcology maintains the high standard of the previous editions. The general plan of the book is as before: Part I is devoted to physiology, etc., Part II to diseases of gynæcology and Part III to operative gynæcology.

The work is designed, as the author said of the first edition, "both as a text-book and general reference book." We recommend it most strongly both to the specialist and the general practitioner, particularly to the former; it represents all that is modern, sound and stimulating in gynæcology.

The physiology of menstruation and ovulation is brought up-to-date by the inclusion of the work of Novak, Frænkel and others. This chapter is excellent and the only statement we would question is that of Engleman, "that the average age of puberty is very nearly the same in the tropics and in the Arctic zones—namely, about fourteen and one half years." Workers in India know that this is incorrect, at least so far as India is concerned. There is an excellent chapter entitled "The Relationship of Gynæcology to the General Organism," in which endocrinology and organotherapy are dealt with in a manner that is very sound and free from the influence of the canning industry. The author uses "ovarian residue" with benefit but does not state the mode of administration. We are pleased to see that parathyroid extract is recommended to be given hypodermically as "Collip's Extract," as we have never seen any benefit whatever from oral administration. The other organotherapeutic agents are judiciously discussed.

The chapter on "General Inflammatory Processes" is very good. The author is inclined to sit on the fence in the battle between the exponents of the radical and conservative methods of treating acute salpingitis.

The account of the treatment of fibroids by myomectomy is remarkable for the fact that the greatest pioneer of this method in the British Empire—Bonney—is not even mentioned, nor is there any mention of his myomectomy clamp which has done so much to improve the technique of the operation. Subtotal hysterectomy is recommended as the operation of choice for fibroids, and it is added "if the cervix is to be left, erosions or lacerations should always be treated as a preliminary step of the operation." We disagree; we consider that the correct treatment in such cases, i.e., fibroids with an unhealthy cervix, is a total hysterectomy.

"Cancer of the Uterus" is preceded by a discussion on cancer in general. It is excellent. The pages devoted to cancer of the body of the uterus and of the cervix will well repay the reader for perusing them. The increasing claims of radium as against Wertheim's operation are well brought out and the methods of treatment by radium and by Blair Bell's colloid lead are fully described. The transplantation theory of Sampson, as well as the rival German theory, is fully discussed in the chapter on Endometriosis, which is one of the best in the book. The author points out that if the former theory is correct, various intra-uterine manipulations will have to be modified; we would ourselves add that if Sampson is correct, the present widespread practice of tubal insufflation must now be sowing the seeds of a positive epidemic of endometriomata; there are, however, no signs of it so far.

Ovarian tumours are re-classified in a manner that is "useful to the student and the operator." The old division into benign and malignant is abandoned owing to the nearly imperceptible manner in which one merges into the other. The term "parovarian cyst" is retained and Keith's term "fimbrial cyst" is not used. The condition usually known as chronic metritis or fibrosis uteri is disguised under "uterine insufficiency"; the omission of the older and better known term is strange in a work of this size.

The complicated subject of Sterility is well done, but we think it will be a loss to the average reader that there is no detailed description or illustration of any apparatus for tubal insufflation, especially as much space is devoted to radium which will be used only by a few. We know of no proof for the statement that the method of insufflation by air "is much inferior to Rubin's technic, both on account of its inaccuracy and its greater capability of causing sepsis." The value of salpingostomy in the treatment of sterility is not discussed.

Part III consists of nearly 300 pages, devoted to operative gynæcology. It is profusely illustrated and the author is to be congratulated on the diagrams, which are his own; they are excellently drawn, partly in colours, and lucidly show the steps of the various operations. The operations described are all of the best of American gynæcology. It is interesting to observe the watertight compartments in which British and American gynæcologists work. The latter perform Sturmdorf's amputation of the cervix; most British operators prefer Bonney's method. Graves recommends shortening of the round ligaments by Oldhausen's method which scarcely differs from the original Gilliam's operation: this has long since been abandoned by British operators for one of the extra-peritoneal modifications such as Simpson's (or as British operators would call it—Bonney's) modification. The details of the various methods of performing hysterectomy are well described except the ordinary total abdominal hysterectomy. Wertheim's

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

Vide Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The Dimol Laboratories

have pleasure in presenting to the Medical Profession

A New Dimol Pulverette

prepared to the following formula:—

Dimethylomethoxyphenol	gr.	1
Acid Arsen.	gr.	$\frac{1}{180}$
Ext. Nuc. Vom.	gr.	$\frac{1}{16}$

This new Pulverette will be known as T; and further to safeguard against confusion with Dimol Pulverettes A (white) and B (yellow), it will be coloured pink.

The value of a nerve and general tonic combined with a non-toxic intestinal bactericide of high potency is so apparent, that in introducing this convenient preparation we feel certain it will be of the greatest service in all cases of toxic degenerations with an intestinal focus, and associated with anæmia and diminished vitality of the neurones and endocrine glands.

The *Vis insita* and *Vis nervosa* of debilitated cells are alike catered for in this combination, and medical men are invited to try it personally if run down or over-worked.

Dimol Laboratories Ltd., 40, Ludgate Hill, London, E.C.4.

Dimol can now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

panhysterectomy is admirably described and illustrated. The author agrees with the other eminent American gynæcologist, Howard Kelly, in condemning vaginal hysterectomy. Operations not usually included in a volume on gynæcology are described, such as kidney, bladder and rectum operations as well as those for various types of hernia.

There is, at the end of the book, a full reference list of the authorities whose works have been consulted.

The publishers are to be congratulated on the handsome binding, clear printing and excellent illustrations.

S. A. McS.

KALA-AZAR CHIKITSA (IN BENGALI).—By A. K. Mukherjee, M.B. Second Edition. Calcutta: Published by the Manashi Marmabani Karyalaya, 1928. Pp. 178. Price, Rs. 2.

THE second edition of this useful little book, "Kala-azar Chikitsa," has been written by Dr. Arun Kumar Mukherji, M.B., in Bengalee, bringing it up-to-date. Since the first edition appeared considerable advances have been made in the diagnosis and more especially in the treatment of kala-azar. The book is written in a clear Bengalee style and is full of practical hints. It should be most useful to those doctors practising in the mofussil who are better acquainted with Bengalee than with English. It has also the additional advantage of costing only Rs. 2 which should place it within the reach of even the poorest, struggling practitioner.

E. M.

THE TREATMENT OF DIABETES MELLITUS.—By Elliott P. Joslin, M.D. (Harvard), M.A. (Yale). Fourth Edition. London: Henry Kimpton, 1928. Pp. 998. Illustrated. Price, 42s. net.

THE third edition of this well-known and authoritative book on diabetes was reviewed by us about 4 years ago. The present edition is a much larger volume, several chapters having been completely rewritten with a view to assimilate and incorporate the new conceptions, lately formulated, which have changed the outlook, not only as regards the physiology and pathology of diabetes, but also in respect of its treatment.

The complete story of Hedon's depancreatized dog, which the author has so lucidly described with the help of photographs, is a very useful and interesting study, as it established a close correlation with cases of human diabetes, some of which pass through most of the stages gone through by the dog. The importance of careful dietetic restrictions, the close relationship between diet and insulin, the evil effects that follow sudden stoppage of treatment leading to complete coma, and the almost magical effects caused by the resumption of insulin injections and by intravenous injections of sodium bicarbonate (with a view to immediate amelioration of symptoms) have been very vividly shown in the photographs.

The author has devoted 50 pages in section XIII to diabetes in childhood with a record of 395 diabetic children. The chapter on complications in diabetes has been dealt with much more elaborately than in the previous edition and it will prove to be of great value to practitioners.

Professor Joslin's book is a complete up-to-date book of reference on the subject of diabetes and we have no hesitation in saying that it is one of the best books that are at present in the market. It should prove very useful to general practitioners as well as to research workers on the subject of diabetes.

J. P. B.

URINARY ANALYSIS AND DIAGNOSIS BY MICROSCOPICAL AND CHEMICAL EXAMINATION.—By Louis Heitzmann, M.D. Fifth Revised Edition. London: Baillière, Tindall and Cox, 1928. Pp. xvi plus 366, with 131 figures in the text. Price, 22s. 6d. net.

THIS book in one of the best of its kind we possess on the important subject of analysis of urine and has proved to be very useful and helpful as a work of reference and also as a valuable guide to both clinicians and laboratory workers. The author has embodied in this revised and enlarged edition all up-to-date information about the physiological and pathological aspects of urine, and has furnished us with an additional list of useful tests of practical value for the detection of abnormal constituents with minute details of the technique. The book is profusely illustrated with pictures of deposits of urine drawn directly from nature by the author, the importance of which in arriving at a correct diagnosis of genito-urinary diseases can hardly be over-estimated. The correct identification of the epithelia of the tubes and pelvis of the kidney as well as of the bladder and the genito-urinary passages is often a matter of considerable difficulty even to an experienced analyst. It is the microscopical examination of the urinary deposits which could clear up many obscure cases left undetermined by clinical observations and chemical examination of the urine. The pictures will be most helpful in making a correct diagnosis and prognosis of diseases of the genito-urinary tract. We endorse the view of the author that if microscopical examinations of urine are carried out more carefully than is generally done, even at the present time, uranalysis is bound to become of far greater benefit to both physician and patient than has so far been the case.

The chapter on "Determination of functional efficiency of the kidney" will be found interesting and profitable reading. The renal function tests described therein are of great practical value to the practitioner; they furnish him with a better conception of his patient's general metabolic activities and especially elimination by the kidneys. They likewise indicate the progress as well as the extent of involvement or destruction of kidney tissues in certain disease processes, and are of great importance to the surgeon also. This chapter has been written for the author by Dr. W. T. Dannreuther and forms a useful appendix to the volume.

We strongly recommend the book to all medical practitioners and analysts.

J. P. B.

THE PATHOLOGY, DIAGNOSIS AND TREATMENT OF NEOPLASMS ORIGINATING IN THE WALLS OF THE URINARY BLADDER.—By Lionel R. Fifield, F.R.C.S. (Eng.). London: H. K. Lewis and Company, Ltd., 1928. Pp. xi plus 94, with 6 coloured plates and 6 other illustrations. Price, 7s. 6d. net.

THIS monograph is the essay for which the Buckston Browne Prize was awarded by the Harveian Society. It is composed of three parts—the first deals with papillomata and carcinomata, the second with rare growths of the bladder and the third with transplantation of the divided ureter for carcinoma of the bladder and some experimental research thereon. The author experimented on thirty dogs and cats to determine whether ascending infection following anastomosis of the ureters to the large bowel travelled by way of the lumen or lymphatics and its relationship to stricture at the anastomotic site. He concludes that 60 per cent. of cases of transplantation of the ureters develop ascending infection which extends by the lumen and by the lymphatics and may occur independently of stricture of the lower end of the ureter—the latter results in about 30 per cent. of cases. The coloured plates are good and there is a selected bibliography and a good index at the end of the book.

H. G. A.

DISEASES OF THE BLOOD.—By A. Piney, M.D., M.R.C.P. London: J. A. Churchill. Pp. viii plus 195, with 20 illustrations, 6 in colour. Price, 12s. 6d. net.

THE author apologises in the preface for adding another to the long list of books dealing with the diseases of the blood. We are familiar with a number of books on this important subject and we certainly agree with this author when he says that no other book quite covers the same ground.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The book is much more than a monograph on diseases of the blood. All the common and a number of uncommon diseases of the blood are dealt with, but in addition full details of the methods of examining the blood and excellent descriptions of all the normal and abnormal cells are given.

The book is printed throughout in large clear type on good art paper. There are a large number of plates which include some very fine coloured illustrations. It is a book which will be most useful in the wards and in the laboratory, and we can thoroughly recommend it to both the under-graduate and the post-graduate student.

L. E. N.

DENTAL MEDICINE.—By F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S. (Eng.). London: William Heinemann (Medical Books), Ltd., 1928. Pp. xv plus 364. Price, 21s. net.

IN "Dental Medicine" Mr. Broderick has treated an old subject from an entirely new standpoint. With the help of bio-chemistry and endocrinology he puts forward a new theory to explain the incidence of dental caries and so-called pyorrhœa alveolaris—his suggestion is "that the acid-alkaki balance is the bed-rock cause of both dental caries and of pyorrhœa" and his arguments are most convincing.

Mr. Broderick is to be congratulated on the results of many years' arduous and expensive research work, particularly as he has not been supported by the Dental Board of Great Britain, to whom most other research workers are indebted for annual grants. "Dental Medicine" should be read by all dentists; it will prove of great interest also to all physicians and general practitioners, and "help them to attain a more perfect appreciation of the rôle that the teeth play in the preservation of health and perhaps prevent the indiscriminate extraction of these organs."

J. E.

MANUAL OF HYGIENE AND PUBLIC HEALTH.—By Jahar Lal Das, D.P.H. Calcutta: Butterworth and Co. (India), Ltd., 1928. Pp. xx plus 661. Price, Rs. 3-8 net.

WE reviewed the first edition of this book about 3 years ago, and this is the second edition (1928), and in it much new matter has been inserted. The whole subject of hygiene is divided into 28 chapters and 12 appendices, and there are 105 illustrations. The author says in his preface that this manual has been written principally for medical and public health students, by which he means that it is for helping those students who are going up for their M.B. and D.P.H. examinations. This book is the outcome of his long and varied experience in public health work. The author has worked in the Public Health Departments of the Bengal, and Bihar and Orissa Governments and he has rightly placed his experience at the disposal of other workers in this line, to be utilized if they so desire. The author has endeavoured to bring the book up-to-date and to make it as practical as possible. In this attempt he has undoubtedly succeeded to a great extent. For an honest and impartial review we offer a few criticisms and mention certain omissions, which we hope will be useful to the author when bringing out a new edition.

In the first chapter on vital statistics, for the estimation of population the formulæ $P^1 = P + R^n$ in the *n*th year and log. P^1 = log. P + 10 log. R, are both evidently wrong and misleading to students. In the second chapter, "atmosphere" is stated to reach a height of *several hundreds* of miles above the earth's surface, which is not correct. On the subject of vitiation of air by respiration, in one place it is mentioned that the ill-effects are neither due to increase of carbon dioxide nor to the decrease of oxygen, but to the increase in aqueous vapour and rise in temperature. In this connection a very important factor, viz., the want of movement, or the stagnation of air, has not been mentioned.

In the section on bacteriological examination of water, the definition of the typical *B. coli* given is obviously taken from foreign text-books, and is evidently incomplete; it will include many hardy sewage bacilli of little importance, while it will exclude some of the useful indicators of fresh sewage pollution. Then again, for the isolation of undoubted *B. coli* derived from sewage from those atypical *B. coli* which are not derived from sewage, the method described is not clear. The author does not say what the positive reaction in the glucose medium is; students will either understand nothing or will take it to mean 'acid and gas production.' It is very important to know whether sewage pollution is of recent date or of remote duration. In up-to-date laboratories in India, after the counting of lactose fermenters as a preliminary test of sewage pollution, a further test is generally made for eliminating non-sewage lactose-fermenters by using certain sugars. This method is not described and there is therefore a likelihood of much confusion being created in students' minds.

The paragraph on the subject of food poisoning is, on the whole, well-written; but the classification into (1) food infection as caused by the bacilli of the Gärtner group, and (2) food toxæmia as represented only by botulism is not strictly correct. The Gärtner bacillus may cause pure infection or pure toxæmia or more commonly both infection and toxæmia. Botulism (or sausage poisoning), is as a rule toxæmic but it is practically unknown in India; it is this toxæmia which is fatal in 50 per cent. of those attacked; the toxæmia of ordinary food poisoning is not so fatal.

On the subject of anti-cholera inoculation, the author gives Haffkine's vaccine and Castellani's mixed vaccine, and ends the paragraph by saying "In practice generally 1 c.c. of Haffkine's prophylactic vaccine is injected with encouraging results." Not a word about the vaccine which is really used, viz., a suspension of dead vibrios!

On the subject of the ætiology of malaria, and on its prophylaxis, contrary statements are made which would naturally create utter confusion in the minds of students. Causes of malaria in a deltaic area are different from causes in a non-deltaic area, and consequently measures of prevention and control are also different. Ricefields in Eastern Bengal are not at all malarious, whereas ricefields in the United Provinces and in Rajputana are very malarious. Efficient drainage in Eastern Bengal is not only impracticable from the engineering point of view, but is positively ruinous both from the public health and agricultural points of view, even if it were possible as an engineering measure. The cultivation of jute and the steeping of jute stalks in stagnant pools and ponds have nothing to do with malaria. The more dirty, stinking and foul a collection of water is, the less the likehood of anopheles mosquitoes breeding in it.

These are some of the defects in the manual which would be better removed in the next edition.

Looking to the very low price and the vast amount of subject-matter included in a small compass, the manual ought to be welcomed by students of medicine.

R. B. K.

TWO ESSAYS ON ANALYTICAL PSYCHOLOGY.—By C. G. Jung, M.D., LL.D. (Authorized translation by H. G. and C. F. Baynes.) London: Baillière, Tindall and Cox, 1928. Pp. xviii plus 280. Price, 10s. 6d. net.

THE subject-matter of this volume is based on two papers published some years ago under different titles in the "Collected Papers on Analytical Psychology." Let it be stated at once that this work will appeal to a very limited circle, the members of which have a thorough grasp of "advanced" psychology in all its ramifications.

Turning to the essays themselves, the first, entitled "The Unconscious in the Normal and Pathological Mind," opens with a chapter on the origins of psycho-analysis; here is described the epoch-making work of Freud which has exerted, and is exerting, a profound influence on psychology and psycho-pathology. As a result of his researches the influence of mental trauma as the factor of importance in the causation of neurosis

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Against RHEUMATISM AND GOUT

Atophan

Schering

Powerful eliminator of uric acid. Gives relief from the troublesome effects of the salicylates, counteracting them by the intensity of its therapeutic action.

SCHERING-KAHLBAUM (INDIA), LTD.

Telephone: Cal. 4770
Telegrams Aeskulap

CALCUTTA

4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

F. SCHWERZMANN & CO., Rangoon (Burmah): 26, Merchant Street.

Original packing:
Tubes containing 20 tabl.
of 7½ grains each

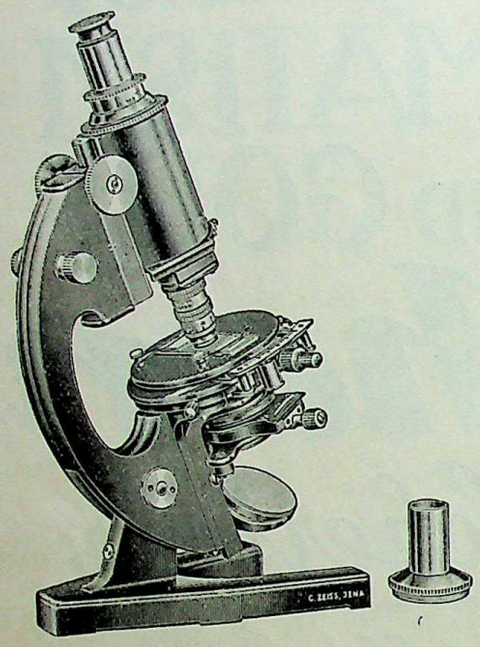
20125901

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ZEISS

NEW LARGE MICROSCOPE



G C E

With wide body tube for PHOTOMICROGRAPHY and RESEARCH.

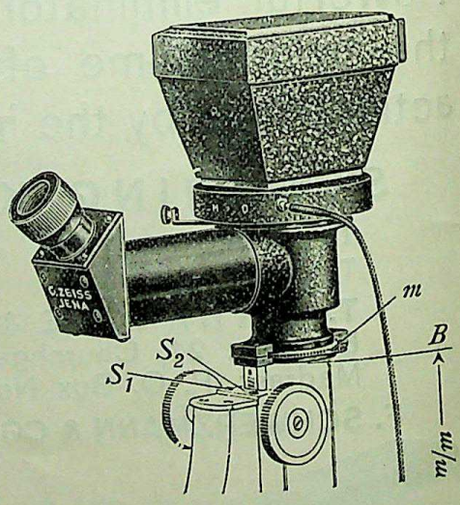
Large mechanical stage, Meyer slow motion fine adjustment, Abbe illuminating apparatus—Rs. 432.

OPTICAL EQUIPMENT AS DESIRED.

"PHOKU" Eye-piece for Photomicrography—Can be attached to the microscope in place of an Eye-piece.

Field of view observable by the side tube.

A most handy and efficient photographic apparatus for microscopes, giving pictures for $6 \times 4\frac{1}{2}$ cm. plates.



Complete in case with Goldenberg Neutral wedge plate. Rs. 270.

Full particulars from the sole distributors—

ADAIR, DUTT & Co., Ltd.,

5, Dalhousie Square E., CALCUTTA.

(Branches : BOMBAY & MADRAS.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

has been very largely replaced by a belief in the presence of a concealed erotic conflict—a disturbance, that is, in the sphere of love; using "love" in the broadest sense—in all cases of neurosis. The author does not find himself in complete agreement with the theories of Freud or of Adler. "It is manifest," he says, "that each has its field of application in those cases which prove the correctness of the theory. As to those cases that cannot be harmonized with it, well—every rule has its exceptions." In particular, Jung points out that the disposable psychical energy which is obtainable by the psycho-analytic technique is of comparatively little value, in that it cannot in many cases be "sublimated" or transferred at pleasure to a rationally chosen object.

One of the most interesting chapters in the book is that entitled "The Personal Unconscious and the Super-personal or Collective Unconscious." The author demonstrates that two levels can be recognised in the unconscious: (*a*) the personal unconscious, and (*b*), what he terms the super-personal unconscious or collective unconscious, the latter consisting of "those potentialities of human representations of things as they have always been, inherited through the brain structure from one generation to the next."

In the section on the function of the unconscious we are given a definition of individuation, viz., "a psychological evolutionary process that fulfils the given individual dispositions.....by which a man can create of himself that definite unique being that he feels himself at bottom to be....." It is rather curious to find that Thomas à Kempis expressed the same thought five hundred years ago when he says, "The more a man is united within himself and becometh inwardly simple and pure, the more and higher things doth he understand without labour."

We have only one criticism to offer, and it is not a criticism of the author but of the translator. Jung is undoubtedly one of the greatest of modern scientific thinkers, and by that same token he is the less in need of the somewhat fulsome flattery that the translator has seen fit to accord him in the preface. The translator's remarks on the attitude of the medical profession towards his idol (Jung) are unnecessarily caustic. Medicine is accused of having assimilated Freud and his teachings "exactly in the same way that the Church of Rome digested Francis of Assisi and with no more attention to the point of view of the digested party"; that this "phagocytic action" has not been performed in the case of Jung is attributed to an obtuseness based on materialistic grounds.

Considering that medicine has to deal with the most precious of human possessions, a meed of materialism is perhaps inevitable.

Printing, binding and general get-up of the book are excellent.

J. M. H.

RONTGENOLOGY.—By Alban Kohler. Translated into English from the fifth German edition by A. Turnbull, M.A., B.Sc., M.B., Ch.B. (Glas.). London: Baillière, Tindall and Cox, 1928. Pp. xviii plus 556, with 324 figures. Price, 42s. net.

THE volume in German is the fifth edition of a work originally published in 1910, and that under review is the first English translation. To use Professor Köhler's words, the work is meant to be "an adviser on those findings which exhibit or appear to exhibit slight and not particularly noticeable divergencies from the normal anatomical picture."

The work is well described as a veritable mine of information on everything connected with *X*-ray examinations. The general plan adopted is first of all to describe the normal appearances, including processes of ossification in the case of bones, and then to discuss the pathological variations from different points of view. Each of the various systems of the body is considered in turn and practically every abnormality or early pathological change that is capable of demonstration by *X*-rays is considered.

Reproductions of skiagrams are largely replaced by carefully detailed line drawings giving the outline of the important features. This is an excellent plan and one to be recommended to other writers on the subject. One cannot help observing, however, that the skiagrams reproduced are of poor quality.

The work of translation has been well accomplished, although the style is somewhat stilted. This, of course, is inseparable from the desire to preserve as far as possible the author's idioms and metaphors. On the whole, Dr. Turnbull is to be heartily congratulated.

As a work of reference for the radiological expert this book has no equal. There is no other work which deals with slight departures from the normal and their pathological significance in such detail.

J. A. S.

THE PRACTICE OF REFRACTION.—By W. S. Duke-Elder, M.A., D.Sc., Ph.D. (Lond.), M.D., Ch.B., F.R.C.S. London: J. & A. Churchill, 1928. Pp. xiii plus 410, with 208 illustrations. Price, 12s. 6d. net.

THIS is a really excellent modern book on refraction, rather on the lines of Ernest Clarke's well-known book, but much more modern and scientific in its methods and detail, as might be expected from the previous work of this author.

His explanations on the scientific side are good and clear, and on the practical side he stresses the utility of retinoscopy without a mydriatic and gives many little tips for accurately determining the amount and angle of an astigmatic correction by this method.

This method will prove much more difficult in practice in India, with its bright glare in which we live and work, than in England where, living in a normally dull light, the movements of a bright small spot are much more easily appreciated and consequently the problems of light perception and contrast are different.

The work is thoroughly practical and complete and all interested in the problems of refraction should read it; they will find it a mine of information incorporating much recent work put in a well-balanced way.

W. V. C.

Annual Reports.

THE ROCKEFELLER FOUNDATION, ANNUAL REPORT, 1927. THE ROCKEFELLER FOUNDATION, 61, BROADWAY, NEW YORK.

A GLANCE at the Rockefeller Foundation Annual Report for 1927, which has come to hand, reveals the world-wide activities of this great organisation whose avowed object is the promotion of "the well-being of mankind throughout the world."

Features of interest so far as we in India are concerned are the following:—

MALARIA CAMPAIGN IN CEYLON.

Malaria is a serious public health problem in many parts of Ceylon. An engineer has been lent to the Government by the Foundation to organize a division of sanitary engineering, which should play an important part in anti-malaria operations. One of the men recently trained under a Foundation fellowship has returned to Ceylon to continue his work in malaria. As a result of several years' study of the anophelines of Ceylon, a new vector has been discovered, *A. culicifacies*.

HOOKWORM RESEARCH IN MADRAS.

Under the direction of the Foundation's representative a study of hookworm infection was carried on in the Madras Presidency, India. Newly acquired infections with *Ancylostoma duodenale* were shown to produce much greater damage than is experienced from infections acquired over a long period of time. The fall in the amount of hæmoglobin in the blood was rapid and striking. Studies were under way to determine a longevity curve for hookworms in the intestinal tract. Trials of tetrachlorethylene, a vermifuge which

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

has been recommended for use in place of carbon tetrachloride, gave encouraging results.

PERMANENT HOOKWORM PROGRAMME MAKING SATISFACTORY PROGRESS IN CEYLON.

The Foundation continued to assist the Government of Ceylon in a hookworm programme by assigning a representative to act as adviser and participate in the administration of the work, and also by contributing toward the expenses of a rural health unit, which is taking over the hookworm work in the area within its jurisdiction. The effort to reduce the prevalence of hookworm disease first in the areas of heaviest infestation was continued. The medical services of various plantations treated the labourers at semi-annual intervals. In addition, hookworm treatment was given to practically all persons applying for medical relief at public hospitals or dispensaries. The total number of hookworm treatments administered in 1927 was 1,573,955 of which 1,039,003 were given by government hospitals and dispensaries. All tea and rubber estates, about 2,000, were offered an opportunity for one day's treatment of their labourers. Of the total 159,431 labourers passing through Mandapam camp on the way from India to Ceylon, 141,720 were treated for hookworm infection.

During the year, 302 latrines were built in villages, bringing the total number constructed since the inauguration of the hookworm campaign up to 6,128; on estates 2,112 new latrines were constructed bringing the total up to 4,182. In the schools of the island 162 latrines were installed during 1927. Educational measures described in previous annual reports of the Foundation were continued during the year. It was arranged for the Department of Medical and Sanitary Services to take over the hookworm campaign at the end of the year and to conduct it in connection with the sanitary division. All the schools in the island have been visited once and some of them twice since the inauguration of the campaign.

INTENSITY SURVEY DEFINES HOOKWORM PROBLEM IN THE MADRAS PRESIDENCY.

The intensity survey of hookworm infection in the Madras Presidency, India, was completed in October, 1927. This survey, which covered twenty-five districts and the Mandapam labour camp, involved 58,017 egg counts and is the most extensive study of this kind undertaken in any part of the world. An analysis of the survey findings has made it possible to define the areas in Madras where hookworm infection is of economic importance. Infection rates vary in different districts from 12 to 94 per cent.; the average for the presidency is 73 per cent. It is shown that infection is acquired at an early age and between the tenth and twentieth years reaches a maximum which is maintained practically throughout life.

The highest average egg count, 1,377 eggs per gram, was found in the Ganjam district. This represents an average of approximately 110 hookworms per person. Ten other districts approached this average, namely, Chingleput, East Godavari, Malabar, Nellore, South Arcot, Tanjore, Trichinopoly, Vizagapatam, West Godavari, and the foothills of the Nilgiris. Since the infestations are chiefly with *Necator americanus*, an average of 100 worms per person is not sufficiently important from an economic point of view to warrant the usual treatment measures. Therefore employment of the so-called mass treatment of hookworm infection is not justified in the Madras Presidency. It is believed that health education, routine treatment of all hospital and dispensary patients, and the promotion of latrine construction will reduce hookworm infection to relative insignificance. The active programme now being developed is based upon these fundamental factors.

To promote a programme of rural sanitation compatible with existing conditions, demonstrations in soil sanitation were continued in the Madura district and initiated in certain estate areas in the Nilgiri district. In Madura, work was considerably extended. Deep pit latrines of the bored-hole type apparently meet the requirements of Indians, as is shown by the increased use of these conveniences. Three hundred and fifty-one such latrines were constructed in 1927, in response to popular demands. Experience has proved that this type is effective, easily maintained, and economically feasible. It gives promise of solving the soil-pollution problem in areas where suitable terrain conditions prevail. A steel borer has been lent to private enterprises and to the Chingleput District Board to promote similar latrine construction in other communities.

The government health officer appointed to work on estates commenced activities on Nilgiri plantations. Initial efforts have brought about commendable improvement in sanitation, and the favourable reaction of estate labour in the use of sanitary latrines augurs well for the future. Treatments have been administered only in villages or on estates where sanitation was in progress. Towards the end of the year curative work was undertaken among school children in the Madura, Chingleput, and Malabar districts. A total of 24,123 treatments has been given.

Educational work through the media of lectures, demonstrations, films, and charts was carried on in every district in the presidency. Types of latrines suitable for village needs were exhibited at fairs and festivals. In the Madura district important educational work was accomplished by installing a sufficient number of bored-hole latrines to accommodate several thousand pilgrims assembled for religious functions.

Approximately 137,686 persons were reached by lectures and, in addition, the films on hookworm and malaria attracted many thousands of people. All govenment hospitals and dispensaries are required to treat hookworm infection as a routine measure in accordance with a government regulation effective from April, 1927. This work is developing favourably. Approximately 76,000 treatments were administered during the year. It is anticipated that between a million and a half and two million treatments will be given annually in these institutions.

Plans to administer one treatment each year to school children, led the Government to provide funds to develop a programme of treatment, education, and sanitation in all schools where medical inspection is conducted. Work was initiated in Madura, Chingleput, and Malabar districts by members of the campaign staff who instructed school medical inspectors in treatment technic.

SURVEY OF HEALTH CONDITIONS IN THE NATIVE STATE OF MYSORE, INDIA.

The invitation of the native state of Mysore, India, for a public health survey was accepted, and a member of the field staff sent to direct the work. Efforts are being made to determine the incidence of hookworm infestation and malaria, which are reported to be serious health problems.

By the close of the year the first spleen survey was completed except for some small areas; 8,143 children had been examined, of whom 36.1 per cent. showed enlarged spleens. Of 3,038 persons examined for hookworm infestation, 77.5 per cent. were infected. Egg counts were employed in the case of 2,713 persons, of whom 78.3 per cent. were found positive, with an average egg count of 2,200 eggs per gram.

SUCCESS OF DISTRICT HEALTH WORK IN CEYLON.

The health organization in the Kalutara district of Ceylon continued to function throughout the year. The Government also voted funds to provide two additional health organizations, one of which was established in the Kurungala district in North-Western Province late in 1927. This type of work is now well established and seems to meet the needs of the people of Ceylon.

Four health centres operated in the Kalutara district during the year, two in urban areas and two in rural sections. At one of these, Koholana, established in 1926, the first model child welfare and maternity centre in Ceylon was opened in December, 1927. The site, building, and equipment were provided by public-spirited residents of the community. At Kalamulla a new station was inaugurated to serve a rural area.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

". . . chemotherapeutic drugs
". . . act by increasing the
"patient's resistance . . ."

(vide 'Nature of Disease': Part II, page 16)

IN such infections as the chronic complications of gonorrhoea, including stricture, chronic epididymitis, conjunctivitis and iritis, and the various forms of chronic muscular rheumatism such as neuritis, fibrositis and arthritis, also in chronic skin diseases, the administration of the chemotherapeutic drug Contramine has met with marked success.

Contramine is issued in solution ready for intra-muscular injection, in the form of pessaries specially for the treatment of chronic cervicitis and endometritis and in solution for local application in cases of chronic ulcers.

CONTRAMINE

Descriptive literature giving particulars of technique and a selection of case reports will be furnished on application to either of the ***B.D.H. representatives resident in India:***

HENRY S. CLARK,
8/10, Waterloo Street,
Calcutta,

BYRAM MISTRY,
119, Parsee Bazar Street,
Fort, Bombay, No. 1,

whose services are willingly at your disposal.

The British Drug Houses Limited

LONDON

Co/Aus/292

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

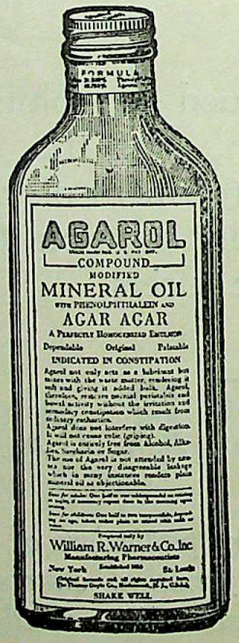
Digitized by Arya Samaj Foundation Chennai and eGangotri

You Can Decrease the Dose

WHAT other laxative can you prescribe and feel sure that, after a reasonable time, you can not only gradually reduce the dose, but in most instances stop its use entirely. You may have some favourite preparation that will permit the foregoing *occasionally*, but with Agarol you may count on doing this in the average case of constipation with ***surprising regularity.***

Clinical experience has shown that Agarol restores the inherent, or physiological powers of the bowel to a point where it can perform its functions naturally without requiring the aid of continued medication.

AGAROL the *original* Mineral Oil—Agar-Agar Emulsion, has these special advantages: Perfect emulsification; stability; pleasant taste without artificial flavouring.



Freedom from sugar, alkalies and alcohol; no contra-indications; no oil leakage.

No griping or pain; no nausea or gastric disturbances; not habit forming.

AGAROL

Prepared by

WILLIAM R. WARNER & CO., INC.,

Manufacturing Pharmaceutists Since 1856.

113-123, WEST 18th STREET NEW YORK CITY

Agents in India—Martin & Harris, 8, Waterloo Street, Calcutta; 119, Parsi Bazar Street, Fort, Bombay; and 20, Sunkurama Chetty Street, Madras.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Milk stations were conducted in conjunction with all centres, and some progress was made in securing safe milk supplies for the district.

The scope of the activities of the health organization has been extended, and attendance at the clinics has shown a wholesome increase. An outstanding feature of the work has been the development of activities to reduce the high maternal and infant mortalities. During the past year 582 mothers and 448 infants were registered at the health centres, and nurses made 3,231 home visits in their interests. Pre-school children received special care, and more than 1,300 home visits were made to 219 young children enrolled. Medical inspection of all school children in the district was completed.

Intensive health education was associated with all activities undertaken. A special course of lectures was given to teachers in the district by the medical officer of the organization. Elementary instruction in personal hygiene, housing, refuse disposal, and conservancy was prepared for the village headmen. At the conclusion of the course certificates of proficiency were awarded. Illustrated lectures, informal talks to school children, distribution of health pamphlets and personal conferences were utilized. The health survey was completed in March. An intensive hookworm campaign was undertaken and treatments were administered to practically 10 per cent. of the population. Latrine construction has been stimulated. General sanitation in the district as a whole has improved since the establishment of the health organization. The reporting of morbidity and mortality statistics has shown improvement.

RURAL HEALTH DEMONSTRATION IN INDIA.

As a means of introducing a general health programme in the Madura district of the Madras Presidency, India, measures for dealing with the outstanding problem, that of sanitation, were undertaken. A demonstration in rural sanitation which was begun in 1926, was continued and considerably extended during the past year. An active programme of health education was conducted by means of illustrated lectures, school talks, personal conferences, and distribution of health literature. Approximately fifty-nine thousand persons attended the lectures and conferences, which dealt with hookworm disease, soil pollution, village sanitation, personal hygiene, and water-supplies.

THE HEALTH ORGANIZATION OF THE LEAGUE OF NATIONS.

Collaboration with the Health Organization of the League of Nations was continued through the contribution of funds toward international interchanges of public health personnel and the further development of a world-wide service of epidemiological intelligence and public health statistics.

In 1927, the plan of interchanges was broadened to include the organization of two international courses of advanced training in public health and hygiene. The first of these was held in Paris at the Institute of Hygiene of the Faculty of Medicine with twenty-six officers from fifteen health administrations in attendance. The first part of the programme included lectures and visits in Paris and the vicinity to study the practical application of various health measures. During the second part of the course, each of the participants visited two or three countries for the study of problems of outstanding importance.

Nineteen medical officers representing fourteen countries met in London in November, 1927, for the second course of this type. The programme of work included lectures and practical studies of public health institutions and organizations.

Two regular interchanges of health personnel were held in 1927, one in Great Britain and the other in Germany. Twelve officials from the health administrations of ten countries participated in the former; while the latter, the first international interchange to be held in Germany, brought together twenty-five health officers from twenty-one countries. After a preliminary period spent in studying the federal public health services, visits were made to several large towns, a mining area, watering places, and small communities. Twelve persons from six countries received subsidies for special studies.

The epidemiological and public health intelligence service continued work along the lines described in previous annual reports of the Foundation. In February, 1927, the Foundation renewed for a period of seven years, beginning in 1928, its agreement with this service to promote special activities relating to the advancement and unification of vital and public health statistics. Annual contributions will be made on a decreasing scale.

In order to secure greater uniformity in statistical procedure, a commission of expert statisticians was appointed late in 1926, to consult with various governments about the contemplated revision of the international list of causes of death. The first meeting of this group was held in March, 1927.

A conference on methods of collection, transmission, and publication of epidemiological intelligence on an international scale was held at Geneva. Recommendations were offered for the improvement of the system now in operation.

The epidemiological work of the Eastern Bureau at Singapore continued to expand; by the end of the year 140 ports were furnishing current information on the prevalence of important communicable diseases. Thirty-five health administrations in the Far East have agreed to notify the bureau of the arrival at their ports of ships having on board persons with communicable diseases. The new epidemiological sub-centre at Melbourne, Australia, provided reports on health conditions in the Austral-Pacific Archipelago. The meetings of the advisory council of the bureau in 1927 were attended by thirty-one persons representing thirteen national and colonial administrations.

During the year a grant was made by the Foundation to assist over a seven-year period in organizing a centre of public health documentation at Geneva. The functions of this centre are the collection and dissemination of information regarding public health activities throughout the world.

REPORTS OF THE INFECTIOUS DISEASES HOSPITALS OF BOMBAY CITY FOR THE YEAR 1927. BY P. T. PATEL, M.D. (LOND.), M.R.C.P. (LOND.), D.T.M. & H. (CAMB.), F.C.P.S., MEDICAL SUPERINTENDENT.

THE ARTHUR ROAD HOSPITAL.

THE total number of admissions during the year was 952 as compared with 463 in the year 1926.

The fatality rate for all the diseases was 20 per cent. as compared with 19.4 per cent. last year.

The total number of admissions among European and Anglo-Indian patients was 22 as compared with 8 in the previous year.

They were distributed as follows:—

15 smallpox, 1 measles, 3 cholera and 3 other diseases. Out of 15 smallpox cases 3 were unvaccinated cases with 1 death, and 12 vaccinated cases. Out of 3 cholera cases 2 recovered and 1 died.

Military admissions totalled one only as compared with none last year.

The total number of beds in the Hospital in normal times is 216 (132 Indian and 84 European).

This figure is calculated on an allowance of 100 sq. ft. of floor space per bed. In an emergency the number of beds can be increased.

DISEASES.

Smallpox.—Smallpox prevailed throughout the year. The highest number of admissions was 174 in March.

Vaccination.—There were 726 smallpox patients of whom 372 were unvaccinated and 354 vaccinated.

The Treatment of Smallpox.—The same routine treatment of smallpox as obtained last year, was carried out, but with improved nursing and hydro-therapy an improvement in the general condition and comfort of the patients was achieved. The serious hæmorrhagic and septic cases are still refractory to treatment although

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

some of the latter respond to polyvalent serum treatment.

Post-Mortem Examinations.—Three autopsies on cases of hæmorrhagic smallpox were performed and in all cases generalised enlargement of glands and muscular hæmorrhages were found.

Cholera.—There were 88 cholera cases admitted this year as compared with none last year. The highest number of admissions was 63 in July, out of which 47 cases were admitted from Rowli Hill Beggars' Home.

Treatment of Cholera.—The same routine treatment—Rogers'—as last year, with some modifications in special cases was carried out, the mortality rate being 32 per cent. The increase in the mortality rate is explained by the fact that the majority of patients were old crippled and debilitated persons from the Beggars' Home. Still, it compares favourably with 50 to 60 per cent. with the old methods of treatment. All cases were examined bacteriologically, and in 41 positive results were obtained.

A total of 1,036 bacteriological examinations of various kinds was made during the year under review.

Dr. P. T. Patel was in charge of the hospital during the year.

THE MARATHA PLAGUE HOSPITAL.

The total number of admissions during the year was 869 as compared with 655 in the year 1926.

The total daily average number of patients was 34.

Employees from Police and Marine Forces, Convicts and Government Servants.—Admissions among these numbered 46 and the charges recoverable from Government for their treatment amounted to Rs. 1,271-8.

The total number of beds in the Hospital in normal times is 106 of which 80 are permanent while 26 are accommodated in temporary wards.

Two wards containing in all 32 beds have been allotted for the reception of advanced cases of pulmonary tuberculosis.

DISEASES.

Plague.—This year the admission of plague cases was more than double that of last year. The total number of admissions of plague cases was 60.

Buboes were incised in 12 cases and removed in three cases by excision.

A total of 164 bacteriological investigations of material from plague patients was made during the year. Of these some were carried out at the Haffkine Institute, Parel, the remainder at the Arthur Road Hospital.

Cerebro-Spinal Meningitis.—5 cases of cerebro-spinal meningitis were admitted in the whole year and all died. All cases were admitted in a moribund condition, two dying within 4 hours after admission. In all 10 lumbar punctures were performed for diagnosis and treatment. No patient was suitable for a course of intra-thecal serum treatment. Four specimens were examined at the Haffkine Institute, Parel, and at Arthur Road Hospital Laboratory, out of which 3 were positive. Two out of the five cases had secondary pneumonia and one got convulsions as a complication.

Post-Mortem Examinations.—Two post-mortem examinations were performed during the year.

Malaria.—The total number of malaria cases treated during the year was 64 comparing with 75 in the year 1926.

Treatment.—All patients were treated with cinchona febrifuge grs. 10 three times a day in a mixture with intravenous injections of sodii cacodylate grs. 5 to 7½ dissolved in 5 c.c. of distilled water every alternate day. Plasmoquine was tried in a few cases with no better results. On the other hand cyanosis was observed in one case under this treatment after the fever had stopped.

Tuberculosis.—446 cases of advanced tuberculosis of the lungs were admitted for isolation during the year.

32 *x*-ray examinations of cases of tuberculosis were done at the King Edward VII Memorial Hospital, Parel.

Treatment.—Most of the cases admitted to the hospital were advanced cases of pulmonary tuberculosis so the treatment followed was only symptomatic with complete rest, good nourishment and nursing. In five selected, one-side cases, artificial pneumothorax was induced with some success. No definite conclusions could be drawn from this as the treatment is necessarily very long and the patients do not take the full course.

Besides the above, 434 patients were treated as out-patients as compared with 388 in the previous year.

Dr. P. T. Patel was in charge of the hospital during the year.

ADMINISTRATION REPORT ON THE JAILS OF BIHAR AND ORISSA FOR THE YEAR 1927. BY LT.-COL. G. W. MACONACHIE, M.B., I.M.S., PATNA. SUPDT., GOVERNMENT PRINTING, BIHAR AND ORISSA, 1928. PRICE Rs. 2.

THE number of jails and subsidiary jails remained the same as in the previous year, viz., 4 central jails, 12 district jails, one juvenile jail and 50 subsidiary jails.

The prison population of all classes at the commencement of the year was 6,771 against 6,211 in 1926. The number of admissions including transfers was 43,711 which exceeded the previous year's figure by 4,980, while the number of prisoners discharged from all causes also showed an increase, being 42,623 against 38,171 in the previous year. The increase in admissions contributed to a larger population at the close of the year, which was higher by 1,088 than that at the end of the year 1926.

The total of the daily average number of each class of prisoners showed an increase of 957.61 as compared with the previous year.

The daily average number of convicts rose from 5,488.76 in 1926 to 6,264.52 in the year under report.

Owing to overcrowding in the Sind jails of the Bombay Presidency, the Government of Bihar and Orissa agreed to take over 50 Beluchistan prisoners from that presidency, and out of these, 46 were received towards the latter part of the year.

Crimes.—There was a further increase in the total number of offences, the figure being 14,523 against 13,009 in 1926. The number of offences against the person as also those against property increased from 1,915 and 5,481, respectively, in 1926 to 2,174 and 5,975, in the year under report. There was an increase in the number of crimes of a serious nature, such as "murder and attempt to murder," "culpable homicide and attempt to commit the same," "attempt to commit suicide," "rape" and "dacoity."

Of the 14,523 convicts received by direct committal, 74.53 per cent. were Hindus, 13.41 per cent. Muhammadans, 0.44 per cent. Christians and 11.62 per cent. other classes. As compared with the figures of the preceding year, the percentages of Muhammadans and other classes, viz., 12.33 and 9.51, have increased while those of Hindus and Christians, viz., 77.24 and 0.91, have decreased. These figures show little variation from year to year and the slight rise or fall is generally due to events which it is not possible to explain.

All prisoners are allowed reasonable facilities to observe their religious practices. Religious and moral instruction is also imparted to the prisoners by voluntary workers and the services of these gentlemen appear to be appreciated.

As usual, persons between the ages of 22 and 40 years contributed the largest proportion of the prison population.

The number of literate convicts was 12.82 per cent. of the total admissions, while that of illiterates was 87.18 per cent. The figures for the previous year were 13.16 and 86.84, respectively.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A FOOD that RAISES the DEFENSIVE POWERS of the Body

Virol is composed of marrow fat, glycerine extract of red bone marrow, eggs, salts of lime, iron, etc., malt extract, and the juice of fresh lemons blended in balanced proportions into an exceedingly fine and palatable emulsion, and prepared in such a manner as to retain unaltered the vital constituents of each of its components.

Its Influence on Resistance

"A series of experiments was undertaken at the Monsall Fever Hospital, Manchester, to ascertain the effect of various nutritive substances in increasing the resistance of the patient to the micro-organisms of the commoner specific infections.

"In the case of Tuberculosis it was found that the opsonic index to the Bacillus Tuberculosis was raised considerably in patients to whom Virol had been administered, and Virol was subsequently in routine use at that Hospital for 450 beds, not only in Tuberculosis, but also for most of the more severe cases of Typhoid Fever, Scarlet Fever and Diphtheria, with entirely satisfactory results."

Medical Superintendent,
Monsall Fever Hospital, Manchester.

Its Restorative Power in Convalescence

Virol has, moreover, a marked effect upon the conservation of the tissues, repairing waste and restoring the equilibrium of a healthy metabolism. Its unequalled value as a repairer of tissue waste is of the utmost importance in bringing about a sound convalescence.

VIROL

VIROL LIMITED, HANGER LANE, EALING, ENGLAND

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

'Byno' Hypophosphites

Trade Mark

An efficient Digestive, Tonic and Restorative

Invaluable in retarded convalescence and asthenic conditions generally.

In 'Byno' Hypophosphites are combined the tonic qualities of the Nux Vomica and Cinchona alkaloids, the restorative value of the mineral hypophosphites, and the nutritive and digestive powers of 'Bynin' Liquid Malt, which is the basis of the preparation.

'Byno' Hypophosphites has for long been prescribed with great success in convalescence after acute infections and following surgical operations; in nervous and mental conditions due to overstrain or exhaustion; as an adjunct in the treatment of tuberculosis; in asthenia of the aged, and in a diversity of conditions where a general tonic and digestive is indicated.

COMPOSITION:

Calcium Hypophosphite	2 gr.	Iron	¼ gr.	Nux Vomica Alkaloids	
Potassium	2 „	Manganese ...	¼ „	(equal to Strychnine)	$\frac{1}{40}$ gr.
Sodium	2 „	Cinchona Alkaloids	1½ „	'Bynin' Liquid Malt ...	1 oz.

In bottles containing 10 oz., 20 oz. and 40 oz.

Further particulars will be sent on request.

Allen & Hanburys Ltd.
LONDON

Special Representative for India:
A. H. P JENNINGS,
Block E, Clive Buildings,
Calcutta

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Compulsory education for all prisoners of 25 years of age and under was continued in the Gaya central jail throughout the year. There were 58 prisoners of this class at the beginning of the year and 54 were admitted to the class during the year, making a total of 112 prisoners. With the exception of 7 prisoners all were illiterate on admission. The number in the class at the close of the year was 84.

These prisoners were taught all the subjects prescribed for the upper primary class by the Education Department and the progress made was most satisfactory. Seven of the boys have already finished their course of class IV of the upper primary standard and 6 have completed the full lower primary course and have been promoted to the upper primary class.

In view of the satisfactory progress made during the experimental period, Government have sanctioned the scheme being made permanent and have lowered the minimum limit of sentence for admission to the class for adolescents at that jail from 2 years to 1 year. Government were also pleased to sanction a third teacher for the school on a pay of Rs. 15—1—20 a month.

The teaching of manual labour and physical drill along with the school work was continued, and the good effect noticed last year on the behaviour and morale of the pupils was again evident.

The question of extending the system of compulsory education to other central jails is under consideration and proposals will be submitted to Government in due course.

An examination of the figures for this and the previous year shows that there was an appreciable increase in the number of persons engaged in agriculture and those following miscellaneous occupations. These two heads account for an increase of 1,205 admissions out of the total increase of 1,514.

The number of female convicts imprisoned during the year was 548 against 461 in the previous year. Their daily average number for the year was 169.09 against 145.69 in 1926.

The total number of youthful offenders and juveniles, i.e., all prisoners up to 20 years of age, admitted during the year, was 989 against 742 in 1926. Of these, 65 juveniles, viz., 63 boys and 2 girls, were under 15 years of age as compared with 49 boys and 7 girls in the previous year.

Juvenile Jail.—There were 168 boys in the juvenile jail in the beginning of the year, 55 were received from the local courts, 278 from jails and subsidiary jails of the province, and 1 from outside the province, making a total of 502 dealt with during the year. Of these, 33 were transferred to other jails to undergo sentence, 286 were released, including 9 released on license under orders of Government, 2 were sent to the Reformatory School and 1 was transferred to the Mental Hospital, leaving 180 juveniles in confinement at the close of the year. The daily average population for the year was 160.89 against 141.18 in 1926.

The percentages of length of sentence of the boys dealt with in this institution during the year are shown below:—

One year and under	81.27
Above one year and not exceeding 2 years	7.57
Over two years	11.16

From the above it will appear that the percentage of short term boys is excessively high and no permanent or substantial improvement is to be hoped for in the character of a juvenile prisoner, unless he is detained in custody for a period sufficiently long for the authorities to acquire some understanding of and hold over his character and to enable them to inculcate habits of discipline, obedience and work. This, however, is not possible unless a Borstal Act is passed empowering magistrates to award at least 3 to 5 years' detention in a Borstal Institution in lieu of a short term of imprisonment. Detailed proposals were submitted to Government after the close of the year for establishing a Borstal Institution in this province and the question is now under the consideration of Government.

The number of youths admitted to jail, as well as the number of adult prisoners, is showing a disquieting increase year by year. It is evident that the punishments inflicted on juvenile delinquents have no sufficient deterrent effect, and the larger the number dealt with in this ineffective manner the greater is the number of youths who will have lost their fear of jail and who will be ready to swell the numbers of the adult and habitual criminal classes.

Youths not obviously weak minded who exhibit anti-social conduct are, as a rule, weak willed or are idle and badly trained, or are deficient in moral sense or in wisdom, or in both. The badly trained and the deficient in moral sense, in the absence of suitable control and training or a sound system of probation, tend to come to jail, and if, in the jail, the punishment inflicted is not deterrent, obviously it is not made clear to them that it is better to keep within bounds and no inhibitory influence is brought to bear upon their moral deficiency. They are, therefore, likely to offend again, and if, in addition, they are defective in the faculty of wisdom and unable to profit by experience and to see things in their true perspective, all the elements exist for the production of habitual criminals. It is desirable, therefore, to inflict sentences which will tend to produce some impression and allow time for influence and training. The weak willed and the defective in wisdom are pathological and can only be dealt with successfully by continuous control.

About 14 per cent. of the boys are found to be of weak mind and it is probable that with adequate examination a much larger number would be found to be abnormal in some respect. The presence of these no doubt complicates the work of the jail school, but the best method of meeting this difficulty is not easy to arrive at, necessitating special examination and special methods of education.

The daily average number of boys employed in different technical classes was 110.65. The main industries were carpentry, blacksmithy and tinsmithy, and the daily average number of boys employed on these industries was 78.79.

Night school continued during the whole of the year and was very useful to the boys. Religious and moral instruction was imparted to them throughout the year by the Hindu and Muhammadan ministers twice a week. Every facility was afforded to the boys of different religions to attend to their prayers and religious exercises.

As poor boys on release are unable to start whatever industries they may have learnt in jail, Government have sanctioned the proposal to provide such boys on release with tools at a cost not exceeding Rs. 10 per head, with a view to enabling them to earn a livelihood after release.

In view, however, of the total indifference of the public and frequently of the parents of these boys as to what becomes of them on release, it is not easy to ensure that this help is usefully or profitably employed.

On the 1st January, 1927, there were 18 civil prisoners in the jails of the province. Two hundred and nineteen were received during the year, making a total of 237. Of these, 212 were discharged, leaving 25 in confinement at the close of the year. The daily average number was 22.83 against 19.45 in 1926.

Three detenus received from Bengal were in confinement at the beginning of the year. Two more detenus were received from Bengal during the year, making a total of 5. One of them was released and 2 were transferred to Bengal during the year, leaving 2 in confinement at the close of the year.

The number of non-criminal lunatics sent to jails for observation was almost the same as in the preceding year, viz., 50 against 51 in 1926.

The number of escapes fell from 16 in 1926 to 6 in the year under report.

Offences and punishments.—The total number of offences committed by convicts during the year was 6,836 against 6,715 in 1926. The increase is due chiefly to rise in the jail population. Compared with the previous year there was an appreciable increase in the number of offences relating to work, while

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

those relating to prohibited articles showed a considerable decline. The ratio of punishments to the daily average population was 109.12 against 122.34 in the previous year.

Statistics of Sickness and Mortality.—The health of the prisoners during the year under report showed a very marked improvement as compared with the health record of the preceding years since the creation of the province in 1912. The daily average number of prisoners of all classes was 7,503.24, or 957.61 more than the figure of the previous year, while the total number of admissions to hospital, the sick rate per mille of average strength, and the mortality rate, were the lowest in the health records of the Bihar and Orissa Jail Department. There was a further fall in the ratio per mille of average strength of admissions to hospital and of daily average sick, the figures being 447.6 and 17.9, respectively, against 613.4 and 24.3 in 1926. The total number of deaths was 78 against 72 in the previous year. This small increase, however, did not adversely affect the death-rate per mille as, owing to the rise in the daily average population, the mortality-rate was actually less than that of the previous year, the figure being 10.3 against 10.9.

A noteworthy feature is the reduction in the number of admissions for bowel diseases, viz., dysentery and diarrhœa, which were reduced by 54 per cent. as compared with the preceding year. This was brought about by the early recognition and treatment of irregularity of bowel action and by careful regulation of diet and hygienic treatment of the general body of prisoners according to season, and bears testimony to the keen interest taken by the Superintendents and medical staff of the jails in the welfare of the prisoners.

The largest number of deaths occurred in the central jails at Gaya, Bhagalpur and Buxar and in the district jails at Purnea and Sambalpur, which were responsible for 13, 11, 8, 9 and 6 deaths, respectively.

Cholera.—There were 4 cases with one death from this cause against one case only in the previous year. Three cases occurred in subsidiary jails and one in the Sambalpur jail, which proved fatal. These sporadic cases are usually due to infections outside the jail or to flies, but prompt measures were taken to arrest the disease and no further cases occurred.

Dysentery.—The year under report showed a marked fall in the incidence of and deaths from this disease, which has caused so much anxiety in the past to the medical management of the jails of this province. There were 176 cases with 3 deaths against 379 cases with 9 deaths in 1926. The largest number of cases occurred at Muzaffarpur jail, viz., 29. The central jails at Buxar and Gaya showed a remarkable fall in the number of cases, there being only 7 and 17 admissions to hospital against 45 and 153, respectively, in 1926. The deaths occurred in the district jails at Motihari and Sambalpur and at the subsidiary jail at Dhanbad. The reduction in the number of admissions and deaths during the year under report is most encouraging and is to be attributed to the careful and systematic examination of the stools of all newly admitted prisoners and to the thorough supervision exercised over feeding and sanitary arrangements. The fall in the incidence of this disease and more particularly in the death-rate, since the introduction of systematic anti-hookworm examination and treatment, is most instructive. The attempts to provide a more balanced and scientific dietary have also materially helped.

Ankylostomiasis.—The stool examination of all the newly admitted prisoners was carried on throughout the year and ova were detected in 7.140 or 51.17 per cent. of the cases examined during the year.

This figure is, however, of the nature of an average, as infection is known to vary in different localities, some being much more heavily infected than others.

The general health of the prisoners improved remarkably owing to the introduction of this system of examination and the decrease in the number of cases of bowel complaints is largely the result of these precautions.

Leprosy.—All the leper prisoners of the province are concentrated in the district jail at Muzaffarpur for segregation and treatment. The daily average number of lepers during the year was 28.97 against 21.01 in 1926.

Malaria.—The number of admissions fell from 789 to 533 and deaths from 7 to 3. The decline in the incidence of the disease was due mainly to the fall in the number of cases at Buxar and Gaya. The number of cases in these jails was 125 and 20 against 206 and 186, respectively, in the previous year. Of the 3 deaths, one occurred at each of the central jails at Buxar and Gaya and one at the district jail at Purnea.

In most of the jails prophylactic treatment with cinchona febrifuge in place of quinine was continued during the year and the results were reported to be good.

Pulmonary Tuberculosis.—The number of cases and deaths from this disease fell from 52 and 18 in 1926 to 43 and 10 in the year under report. The Muzaffarpur jail recorded the largest number of admissions to hospital and deaths from this disease, viz., 7 and 3, respectively. The central jails at Buxar and Gaya and the district jails at Chapra and Purulia returned 4 cases each.

Anæmia and Debility.—There was a remarkable decline in the number of cases from this cause during the year, the figure being 4 against 20 in 1926. There was only one death against the same number in 1926. Here, again, anti-hookworm treatment enters largely into the improvement attained.

Influenza.—Two hundred and ninety cases of this disease occurred with 2 deaths against 245 cases and 1 death in the previous year. The central jails at Bhagalpur and Gaya and the district jail at Bankipur were responsible for the largest number of cases, viz., 114, 107 and 48, respectively. The deaths occurred at the Gaya central jail. The epidemics were again of a mild type.

Filariasis.—There were 2 cases of filarial fever as compared with 15 cases in 1926. The percentage of filarial infection among the prisoners of the Puri jail was 23. Much good work is being done in this jail in connection with the filaria laboratory of the adjoining civil hospital where research is being carried on and prisoners are given the benefit of the most up-to-date treatment.

Pneumonia.—The number of admissions to hospital and deaths fell from 48 and 7 in 1926 to 39 and 6 in the year under report.

Other Respiratory Diseases.—The number of cases and deaths from this cause increased from 157 and 2 to 202 and 4, respectively. The increase was due to the larger number of admissions from this cause in the central jail at Buxar and the district jail at Chapra which were responsible for 71 and 11 cases against 23 and 1. Two deaths occurred at Chapra jail and one at each of the central jails at Buxar and Bhagalpur. Many of these cases no doubt occur in connection with influenzal infections of mild and irregular type.

Diarrhœa.—The incidence of this disease fell by 54 per cent. as compared with the previous year, the number of cases being 227 against 491 in 1926. There were 2 deaths against one in 1926.

Abscesses and Boils, Etc.—The total number of cases from these causes was 183 against 236 in 1926. There was no death.

Accommodation.—The total accommodation available on the 31st December, 1927, in the jails and subsidiary jails of this province was 11,036 against 10,796 or an increase of 240 as compared with the previous year. The accommodation at the central jails at Hazaribagh and Bhagalpur increased by 205 and 35, respectively, due mainly to the construction of a double storied barrack in the former jail and to the construction of a ward in the latter for tuberculous prisoners.

Prisoners' Weighment.—Of the 14,809 convicts released during the year from central and district jails, 57.17 per cent. gained weight, 16.09 per cent. lost weight and 26.74 per cent. neither gained nor lost weight, the figures of the previous year being 57.69, 14.89 and 27.42, respectively.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

phthisis

to protect babies from the risks of tubercular infection the milk supply must be above suspicion Glaxo is always free from B. Tuberculosis : this is guaranteed by the inoculation tests that have regularly been carried out for many years

Glaxo

The Vitamin Milk - Food

Further information and literature gladly sent on request to H. J. FOSTER & Co. Ltd., P.O. Box 202 BOMBAY

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Prostatic Hypertrophy

The simple compensatory enlargement of the prostate, which commonly occurs in men past middle age, responds readily to organotherapy. Frequent and painful micturition is controlled by the exhibition of

TABS. PROSTATE Co.

(Harrower)

One doctor writes: "The difficulty with urination is gone and, with two or three short exceptions, I have had no trouble with dysuria and frequent micturition."

Another, after reporting one case, goes on to say: "I have observed the same beneficial result from the oral use of prostatic extract in a number of other cases, and that this method not only relieves the prostatic condition, but also removes many of the distressing symptoms of a neurasthenic nature attendant upon this condition."

Booklet, "Endocrine Measures in Prostatic Dysfunction," on request.

THE ENDOCRINE LABORATORY, SIMLA.

ENDOCRINES LIMITED

Sole Distributors for
The Harrower Laboratory

WATFORD HERTS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ADMINISTRATION REPORT ON THE JAILS OF BIHAR AND ORISSA, FOR THE YEAR 1926. BY LIEUT.-COL. I. M. MACRAE, O.B.E., M.B., I.M.S., INSPECTOR-GENERAL OF PRISONS, B. & O. PATNA, SUPDT., GOVT. PRINTING, B. & O. PRICE Rs. 2.

THE total accommodation available on the last day of the year in the jails and subsidiary jails of the province was 10,796 against 10,865 in 1925. The decrease is due to the dismantlement of a dilapidated ward in the Buxar central jail. During the year the jail at Purnea, which was reduced to a subsidiary status in 1922, was restored to its former status of a district jail, thereby increasing the number of central and district jails from 16 to 17 and reducing the number of subsidiary jails from 51 to 50.

The daily average number of prisoners of all classes and of convicts rose from 6,227 and 5,298, respectively, in the previous year to 6,545 and 5,488 in the year under report.

The total number of youthful offenders and juveniles up to 20 years of age admitted during the year was 742 against 811 in the previous year. Of these, 56 juveniles, namely 49 boys and 7 girls, were under 15 years of age as compared with 30 boys and 3 girls in 1925. Fourteen of these boys were sent to the reformatory school at Hazaribagh and the rest, as well as those between 15 to 20 years of age, were either detained in the jails of the districts in which they were convicted or transferred to the juvenile jail at Monghyr, to the central jail at Bhagalpur, and to the district jail at Bankipur.

Four hundred and thirty boys were dealt with in the Monghyr juvenile jail during the year under report and the daily average population was 141 against 132 in the previous year. The status of the school was raised to that of an upper primary school during the year and an additional teacher sanctioned for the Hindi section of the school. Night school continued during the whole of the year and religious instruction was imparted to the boys twice a week by ministers appointed for the purpose.

Unfortunately the Juvenile Prisoners' Aid Society at Monghyr could not do any useful work during the year owing to lack of funds. A special appeal circulated throughout the province for funds and support failed to elicit any satisfactory response, and it is feared that the institution—the only one of its kind in the province—will have to close down for want of public support.

It is gratifying to note that there has been a slight improvement in the number of prisoners sentenced to short terms of imprisonment. The percentage of prisoners receiving sentences of three months and under is 54.87 against 57.79 in the previous year.

Sentences of simple imprisonment decreased from 7.86 in 1925 to 5.51 in the year under report. This is due to the amendment of the Code of Criminal Procedure restoring the power of magistrates to award either simple or rigorous imprisonment under section 123(6) of the Code.

In view of the satisfactory results attained during the experimental period by the star class system of classification of prisoners introduced in the Hazaribagh central jail, with effect from the 25th December, 1924, Government have made the system permanent at that jail and have sanctioned an allowance of Rs. 10 a month to an assistant jailer to teach the star prisoners reading and writing, and of Rs. 2 a month to a head warder to train them in physical drill.

Sixteen escapes, seven among convicts and nine among undertrials, took place during the year against 13 in the year before. Of these, five convicts and six undertrials were re-captured before the year closed. In all cases the warders responsible for the escapes were suitably dealt with, either judicially or departmentally.

There was an appreciable increase both in the total number of jail offences and punishments and of punishments inflicted on warders and head-warders as compared with the previous year, the figures being 6,715 and 1,608 respectively, against 5,519 and 1,207 in 1925, the central jail at Buxar being responsible for an increase in jail offences from 884 in 1925 to 1,575 in the year under report. The number of corporal punishments fell from 9 in 1925 to 4 in the year under report.

The working of the manufactory department was more satisfactory than in the previous year. The total cash earnings and cash earnings per head increased from Rs. 60,928-8 and Rs. 12-3 respectively in 1925 to Rs. 1,06,813-14 and Rs. 20-3 in the year under report. The total net earnings and net earnings per head, however, decreased, the figures being Rs. 1,41,343-7 and Rs. 26-12 against Rs. 1,50,211-3 and Rs. 30-1 respectively in the preceding year.

The Buxar central jail showed a fall both in cash earnings and net earnings although the daily average number of prisoners employed in the factory was higher than in the preceding year. The manufactory department at Bhagalpur, however, continued to show satisfactory results. There were increases in both cash earnings and net earnings, the figures being Rs. 29,609-8 and Rs. 20,917-12 against cash deficit of Rs. 1,07,914-8 and Rs. 16,309-14 respectively in 1925.

On the whole the improvement shown last year in the health record of the prison population has been maintained. The sick-rate per mille of average strength, 24.3, the number of deaths, 72, and the death-rate per mille, 10.9, were almost the same as in the previous year. The Bhagalpur jail, formerly so unhealthy, returned the lowest death-rate; whilst the district jail at Muzaffarpur was responsible for the highest death-rate, being 43.8 against 16.9 in 1925; the district jail at Cuttack also showed a bad health record in the year under report.

There has been a slight increase in the incidence of and mortality from dysentery during the year, there being 379 cases and 9 deaths against 322 and 5 respectively in 1925. The central jail at Gaya is chiefly responsible for the increase.

In accordance with the recommendation of the Indian Jails Committee several further changes were made during the year. An additional cotton *kurta* is now issued to all prisoners sentenced to rigorous imprisonment, giving thereby to each of them two complete suits of cotton clothing. The scales of gratuity prescribed for convict night-watchmen and convict overseers have been raised from Re. 0-1-6 and Re. 0-4-0 a month to Re. 0-4-0 and Re. 0-8-0 respectively, as an experimental measure.

Correspondence.

DIPHTHERIA IN INDIA.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Four years ago I came across a case of diphtheria in my own house in a child of about two and a half years. He was a bottle-fed baby. At first I took it to be a case of croup and I treated him accordingly. I had already dismissed diphtheria from my mind for I was sure that diphtheria was uncommon in this Chhattisgarh tract of the Central Provinces.

The toxæmia, the rattling in the throat and the difficult breathing went on increasing and the child remained in this state for two days. While cleaning his tongue one morning it was noticed that the piece of muslin was stained with blood. I was present. On examining the throat I found it covered with a whitish, pale, slough-like covering. I had seen a diphtheria throat before and the text-book reading—"It bleeds readily on detaching"—came as a flash to my mind and I took a smear at once. I showed the slide to my officer, Dr. A. C. Sen, who was not definite but said at the time that the organisms might simulate diphtheroids at least. There was, however, anti-diphtheria serum in the Sarangarh State Hospital and I inoculated the baby at once. The croup-like distress disappeared

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

within ten minutes of the inoculation. I was satisfied with my trial, repeated the inoculation and the result was a hastened recovery on the part of the baby. The ulceration of the throat required local antiseptic treatment too, and the strength of the baby was kept up with Virol, and paraffin in addition was given to help the bowels.

For eight months the child had partial laryngeal paralysis; he could not raise any voice and is still defective in speech, and dull compared to average children of his age.

I am sure that a large number of children in Chhatisgarh die of this disease unnoticed, undiagnosed and untreated. Practical laboratory work will amply repay the labours and will certainly throw more light into this subject.—Yours, etc.

DURGESHWAR NANDE,
Assistant Medical Officer,
Sarangarh Dispensary.

SARANGARH STATE, C. P.
1st November, 1928.

ESTIMATION OF BLOOD SUGAR.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—In a recent paper in the *Indian Medical Gazette* (November 1928, p. 624), I have described a bed-side blood-sugar method using as little as 1|50th of a c.c. of blood.

Using a colorimeter,—but otherwise the technique being the same,—I find the method to be quite satisfactory even for the laboratory. Indeed I consider it to be very suitable both for clinical and experimental work, specially when the blood of small animals is to be examined repeatedly for blood-sugar.

The loss of 3 or 4 drops of the solution, which occurs when the pieces of filter paper are removed by a glass rod, though immaterial, can be avoided by not using a glass rod but by extracting the paper twice with boiling tungstic acid reagent.—Yours, etc.

H. N. MUKHERJEE, B.SC., M.B., D.I.C. (Lond.).

BIOCHEMICAL DEPARTMENT,
CARMICHAEL MEDICAL COLLEGE,
1, Belgachia Road, Calcutta.
17th December, 1928.

A CASE FOR DIAGNOSIS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—On the 17th October, 1928, I was called to attend a patient at 11 a.m.; he was a Mohamedan, aged about 25 years. I found him in the following condition.

He was lying on his back with both legs extended, he was catching the abdominal skin of the lumbar region on the left side with his left hand; he was perspiring and his breathing was hurried. He complained of pain in the left lumber region where he was holding with his left hand. He noticed the pain first in the previous night but now it was more severe. I could detect no other abnormalities.

At first sight I thought it to be a case of intestinal colic, so I prescribed one ounce of brandy with 10 minims of tincture of opium and a hot water bottle to the abdomen. A few minutes later it seems he felt better and he was fed with a little rice, with my consultation; soon after this he took a serious turn. At about 12-30 noon I was called again to see the patient as he was in a precarious condition. This time he was unconscious, teeth were clenched, eyes were closed, and the whole body was still. So I dashed cold water on his face two or three times, after which he came to his senses, but he had cramps in his hands and legs. I gave him one hypodermic injection of digitalin gr. 1|100 and strychnine gr. 1|100 and prescribed the following mixture.

Pot. bromide	.. ..	gr. x.
Chloral hydrate	.. ..	gr. v.
Tinct. hyoscy.	.. ..	ʒss.
Aqua m. ad ..	.. ..	℥i.

When I saw him in the evening at 4 o'clock, I was told that he was completely cured soon after the injection and that the stiffness of the arms, legs, thighs and neck had diminished. I saw the patient who was sitting, quite all right, but he complained of enlargement of axillary glands on the side on which I gave the injection. When he came round I asked about his old history and he made me to understand that he had similar pains in the same place about 8 or 10 years ago, but never so severe, and that the whole time he was conscious and had no stiffness or spasmodic pain in the arms or elsewhere.

I shall be highly obliged if any of your readers can throw light on this case.

My grateful thanks are due to Captain J. D. Lamb, Manager, for his kind permission to allow me to publish the notes on this case.—Yours, etc.

M. D. PILLAI, L.C.P.S.,
Medical Officer.

G. S. M. CO., LTD.
RAMANDRUG.
1st December, 1928.

Service Notes.

APPOINTMENTS AND TRANSFERS.

On return from leave Lieutenant-Colonel A. Denham White, M.B., F.R.C.S.E., I.M.S., was reposted as Civil Surgeon, 24-Parganas, with effect from the forenoon of the 13th November 1928.

Lieutenant-Colonel J. S. O'Neill, M.C., I.M.S., Civil Surgeon, on return from leave to Meerut.

Lieutenant-Colonel W. A. Mearns, I.M.S., Assistant Director of Public Health, United Provinces, on return from leave, resumed charge of the II Range on the forenoon of 1st November 1928.

The services of Major G. H. Mahony, I.M.S., are placed permanently at the disposal of the Government of the Central Provinces, with effect from the 10th May 1928.

The services of Major W. J. Webster, M.C., I.M.S., are placed temporarily at the disposal of the Government of Bombay for appointment as Officiating Assistant Director, Haffkine Institute, Bombay, with effect from the 1st July 1928.

Major C. de C. Martin, M.B., I.M.S., an Officer of the Medical Research Department, is appointed as Officiating Assistant Director, Central Research Institute, Kasauli, with effect from the date on which he assumes charge of his duties.

Major H. G. Alexander, F.R.C.S., I.M.S., held charge of the Civil Surgeoncy of Darjeeling, during the absence, on leave, of Major Bomford, I.M.S., from the 18th September to the 3rd October 1928.

Major S. A. McSwiney, I.M.S., Officiating Second Professor of Midwifery, Medical College, Calcutta, was appointed to act as Professor of Midwifery of the institution, in addition to his own duties, from the 12th to 30th October 1928.

LEAVE.

Lieutenant-Colonel J. K. S. Fleming, O.B.E., I.M.S., Deputy Director-General, Indian Medical Service, is granted an extension of three days' leave in continuation of the leave granted to him previously.

Lieutenant-Colonel V. B. Green-Armytage, M.D., F.R.C.P., I.M.S., Officiating Professor of Midwifery, Medical College, Calcutta, and Obstetric Physician and Surgeon, Medical College Hospital, is allowed leave on average pay for six months, with effect from the 12th October 1928.

Lieutenant-Colonel C. H. Barber, D.S.O., I.M.S., Civil Surgeon, Naini Tal, is granted leave on average pay for four months, with effect from 1st December 1928, or date of availing.

Major G. Covell, M.D., I.M.S., an Officer of the Medical Research Department, is granted leave on average pay for eight months combined with study leave for three months

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Preparations

FOR THE USE OF

THE MEDICAL PROFESSION

LIQ. BISMUTHI "SCHACHT."

Absolutely pure and perfectly stable. The original preparation and the most physiologically active solution of Bismuth. Dose: One drachm, diluted.

PEPSINA LIQUIDA "SCHACHT."

A palatable, standardised solution of gastric juice from the pig. Useful in the treatment of dyspepsia. In ten-minim doses it gives excellent results in infantile diarrhœa. Adult dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO "SCHACHT."

Each fluid drachm contains in a concentrated form, besides the Pepsina Liquida, one fluid drachm of Liquor Bismuthi "Schacht." Dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO CO. "SCHACHT."

Contains one grain of Soluble Euonymin in each fluid drachm, in addition to the Pepsine and Bismuth. Dose: One drachm diluted.

BISEDIA.

A combination of Schacht's Liquor Bismuthi and Pepsina Liquida, with Morphia and Hydrocyanic Acid. Of the greatest value in the treatment of Acute Dyspepsia, Gastric Ulceration, Vomiting of Pregnancy, etc. Dose: Half to one drachm, diluted.

LIQ. CASCARÆ DULCIS "SCHACHT."

A palatable and very concentrated aromatic preparation of the finest Cascara Sagrada; free from bitterness and griping action. Dose: Quarter to one drachm.

LENIVA.

An excellent fruit laxative syrup, containing Alexandrian Senna, Figs, Prunes, Tamarinds, etc. Eminently suitable for delicate women and children. Dose: Half to two drachms according to age.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
BRISTOL, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

for sleeplessness and pain

remember that Allonal "Roche" is now the most widely used non-narcotic remedy. Allonal has greatly decreased the use of narcotics—opiates and the older hypnotics. Besides allaying nervousness, fear and restlessness, and inducing refreshing sleep, Allonal alleviates pain. It has been used with success in cases where regular administration of morphine over long periods had previously been the only effective treatment.

SAFE :: QUICK :: EFFECTIVE :: NON-NARCOTIC

SEDATIVE :: ANALGESIC :: HYPNOTIC

Allonal 'Roche'

is especially indicated and highly serviceable in:

Insomnia	**Neuralgia**	**Migraine**
Nervousness	**Headache**	**Carcinoma**
Psychoses	**Sciatica**	**Hiccough**
Menopause	**Neuritis**	**Sea-sickness**
Dysmenorrhoea	**Arthritis**	**Alcoholism**
Dental pains	**Tabes**	**Drug addiction**

Pre- and post-operative pain
Vomiting of pregnancy

F. Hoffmann-La Roche & Co., Ltd.

Manufacturers of

Digalen "Roche," the standardised cardiotonic—Omnopon "Roche," the total opium alkaloid preparation—Sirolin and Thiocol "Roche," the safe, efficient remedies for respiratory diseases—and other high-class specialities and fine chemicals.

Roche Agents in India:

Volkart Bros.

P. O. Box 606, Calcutta
P. O. Box 22, Karachi
P. O. Box 199, Bombay
P. O. Box 45, Madras

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and leave on half average pay for two months, with effect from the 22nd September 1928. His services are placed at the disposal of the Director-General, Indian Medical Service, with effect from the same date.

Major J. M. R. Hennessy, I.M.S., Senior Medical Officer, Port Blair, is granted leave on average pay for eight months, with effect from the 27th December 1928, or the subsequent date from which he avails himself of it.

Major T. L. Bomford, I.M.S., Civil Surgeon, Darjeeling, was allowed leave on average pay for sixteen days from the 18th September to the 3rd October 1928.

Major E. W. O'G. Kirwan, M.B., F.R.C.S.I., I.M.S., Officiating Professor of Ophthalmic Surgery, Medical College, Calcutta, and Ophthalmic Surgeon of the College Hospitals, was granted leave on average pay for twenty-nine days, with effect from the 18th October 1928.

Major B. H. Singh, M.C., I.M.S., Resident Medical Officer, Medical College Hospitals, is granted combined leave for twelve months, viz., leave on average pay for eight months, and in continuation study leave for four months with effect from the 8th November 1928.

PROMOTIONS.

Captains to be Majors.

John Smart Galvin, M.B., I.M.S. Dated 5th September 1928.

G. A. Hildreth, M.B. Dated 11th December 1928.

The promotion to his present rank of Major J. C. John, O.B.E., M.B., I.M.S. is ante-dated from the 27th July 1924 to the 27th January 1924.

Lieutenants to be Captains.

W. J. A. Coldstream. Dated 1st October 1928.

Lieutenant J. Quigley to be Captain (provisional), 1st September 1927.

RETIREMENTS.

Lieutenant-Colonel P. M. Rennie. 23rd August 1928.
Lieutenant-Colonel S. A. Razzak. 1st November 1928.
Lieutenant-Colonel J. B. Christian, I.M.S. 27th June 1928.

NOTES.

CENTENARY OF KING'S COLLEGE.

Work of the Medical Faculty.

ONE of the first Faculties to be established was that of medicine; not long after its establishment, in 1839, the College initiated King's College Hospital in Lincoln's Inn Fields, and from the very beginning medical science has flourished within its walls. Among those responsible for the Faculty in the early days were such men as Herbert Mayo, Richard Partridge, and John Curnow, the anatomists, and Bentley Todd, William Bowman, Lionel Beale, and William Rutherford, the physiologists. Others on its staff have been David Ferrier, Peter Thompson, T. J. Brodie, Alfred Garrod, and Gerald Yeo, whilst it will always be remembered with pride that the College was responsible for bringing Lister back to London in the face of considerable opposition. We need only recall the names of Prof. Arthur Robinson, Prof. David Waterston, Prof. J. E. S. Frazer, Prof. E. Barclay-Smith, Prof. W. E. Dixon, Prof. W. D. Halliburton, and Sir Charles Martin as representative of the many distinguished men who have worked at the College in later years to the advantage of medicine.

Before the war the number of students in the Medical Faculty was about 170, but last year it had risen to 211. The College has the advantage of co-operating not only with King's College Hospital at Denmark-hill, but also with St. George's, Charing Cross, and Westminster Hospitals, from which students come for pre-clinical work. Those who receive their medical education at the College have the considerable advantage of coming into contact with students who are studying other subjects, and their outlook is to some extent broadened as it would be at Oxford or Cambridge.

In connection with its centenary next year, King's College, London, is making an appeal for funds which will be warmly commended by the medical profession. Although the laboratories have been largely remodelled and extended, the anatomical department is still housed in premises which are none too satisfactory, and one of the objects of the centenary appeal for £350,000 is the improvement of accommodation there. A 200 years' lease has been acquired of an area of nearly 5,000 square feet above Aldwych Station, and the building to be put up on this site will enable the College to meet the modern requirements of all its departments except those of chemistry and anatomy, which can best be secured, it is stated, by rebuilding the south-east block and erecting new buildings for anatomy upon the roof at a cost of about £60,000. The anatomical department would there find itself immediately beside the department of physiology, and teaching could be carried out in closer association with the clinical schools. At present the chairs in both these subjects are unendowed, and it is urgently desired that a sum of £25,000 should be found to endow, at any rate, the chair of physiology.

Subscriptions to the Appeal Fund may be sent to the treasurers (who are Mr. Reginald McKenna and Sir Edward Troup) at the College, cheques being made payable to the King's College Centenary Appeal Fund. The Duke of Connaught is President of the Centenary Commemoration Committee.

In connection with the celebration of the centenary a history of the College is being prepared by Professor F. J. C. Hearnshaw, for many years head of the department of history in the college. All royalties accruing from the sale of this volume will go without reduction to the Centenary Fund. This book should be of considerable interest to old King's College students of whom there must be many in India.

INTERNATIONAL MEDICAL POST-GRADUATE COURSES IN BERLIN.

International Medical Post-graduate Courses in Berlin are arranged with the help of the medical faculty of the University by the Lecturers' Association for medical continuation courses and the Kaiserin Friedrich-Haus. Part of the courses take place permanently, part only in March|April, 1929.

I. Permanent Courses.

(*a*) Course during 2 to 4 weeks.

(*b*) Courses as guest-assistants in clinics, hospitals and laboratories during 2 to 3 months and longer for gentlemen desiring to do practical work under systematic supervision.

II. Courses in March|April, 1929.

(*a*) General course: "Progress in the realm of Medicine with special regard to diseases of the heart" (from 4th—16th March) with the co-operation of the following gentlemen: v. Bergmann, Dresel, F. Klemperer, Munk, Rosin, V. Schilling, Schlayer, Straub. Fee RM 80.

(*b*) Special course in urology (from 18th—23rd March) with the co-operation of the following gentlemen: Bätzner, Casper, E. Joseph, v. Lichtenberg, Ringleb, Rumpel. Fee RM 75.

(*c*) Special course in surgery on the theme: "A week on breast and stomach surgery" (from 18th March —13th April) with the co-operation of the following gentlemen: Bätzner, Bier, Borchardt, Katzenstein, Kisch, Müsam, Sauerbruch, Unger. Fee RM 75.

(*d*) Special course in Röentgenology, taking into particular consideration its application in surgery (from 14th—21st April) with the co-operation of the following gentlemen: Chaoul, Max Cohn, Cramer, Frik, Hintze, Lazarus, Levy-Dorn, Munk, Rumple. Fee RM 100.

(*e*) Single courses on all special fields of medical science including practical work.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The courses are held in German, but numerous professors are able to lecture in the English, French and Spanish languages.

The information bureau of the Kaiserin Friedrich-Haus für das ärztliche Fortbildungswesen, Berlin NW 6, Luisenplatz 2-4 is instrumental in procuring suitable lodgings, gives information as to cost of stay, arranges the attendance in clinics at operations, etc., and, upon request, sends detailed syllabuses.

[*Note.*—RM = Reichmark: 1½ Reichmark = 1 rupee (roughly).—ED., *I. M. G.*]

SMALARINA CREMONESE.

THERE are numerous very encouraging reports from Italy regarding the value of Smalarina Cremonese in the treatment of malaria. The reports have been so favourable that the Premier, Signor Benito Mussolini, has decided to apply this new form of treatment in all the malaria-stricken provinces in Italy.

This drug has not yet had an extensive trial in India. A report on a trial in a small number of cases is quoted elsewhere in this number of the *Gazette*.

MELLIN'S FOOD: A CALENDAR FOR THE YEAR 1929.

THE proprietors of that well-known infants' food, "Mellin's," are this year distributing some very attractive calendars. These calendars are made in two sizes, suitable for hanging on a wall or placing on one's desk. We are authorised to say that the first five hundred applicants sending a cutting of this notice will receive one of these calendars gratis. The agents in Calcutta are Messrs. Mackenzie, Lyall & Co., 5, Mission Row, Calcutta.

NOTES ON BURROUGHS WELLCOME & CO.'S EXHIBIT AT THE BRITISH MEDICAL ASSOCIATION MEETING AT CARDIFF, JULY 1928.

YEAR after year the tastefully arranged and distinctive Burroughs Wellcome & Co. stand provides a unique record of the current year's medical, pharmacological, bacteriological, chemical and pharmaceutical progress. A prominent position was given to Ephedrine which has now proved its right to be included amongst drugs of known value. In addition to its use in asthma and hay-fever, this alkaloid has been found efficient as an analgesic in leprosy. As "Tabloid" Ephedrine may be taken by the mouth, it presents some advantages over adrenalin which must be injected and with which it is frequently compared.

A notable product was seen in "Wellcome" Liver Extract which is an active, selected fraction of an extract derived from fresh liver, prepared by a process which has been tested and found efficient by the Medical Research Council. The product is specific in pernicious anæmia. It is issued in tubes, each of which is derived from half-a-pound of fresh liver.

The value of "Moogrol," a mixture of esters of the chaulmoogric acids, in leprosy has been definitely established as a result of careful clinical trials. A more recent development, however, was shown in "Alepol" which consists of the sodium salts of the less irritating, lower melting-point fatty acids of hydnocarpus oil. By means of this product treatment can be considerably improved "Avenyl," which is a short title for 2-myristoxy-mercuri-3-hydroxybenzaldehyde, is used in cases of leprosy complicated with syphilis. It may be recalled that in this condition ordinary arsenical products used in the treatment of syphilis are apt to intensify the leprotic condition.

A representative display of standard Burroughs Wellcome & Co. products added to the general attractiveness of the exhibition. It is of interest to note that "Wellcome" Sera, Vaccines, and Tuberculins are Britishmade at the Wellcome Physiological Research Laboratories and that no physician need depend on foreign sources for a supply of any of these important adjuncts to modern practice.

FRANK ROSS & CO., LTD.

IT will be of some interest to our Calcutta readers to hear that the above well-known firm of dispensing chemists have reopened their Park Street branch at No. 37, Park Mansions.

THACKER, SPINK & CO.

THE firm of Thacker, Spink and Co. may be truly referred to as pioneers in the publishing trade in India, having been established in 1819. They early established a world-wide reputation for the publication of useful, technical, and legal works, specially relating to India, and to-day continue to issue many works of outstanding merit, as may be seen from the pages of their classified catalogue of publications in general and technical literature, just issued. The publication of Indian legal works is a speciality of the firm, and their Law Book list contains many books which have come to be standard authorities, some having run into many editions.

"THE ACTINIC PRACTITIONER AND ELECTROTHERAPIST."

THE first number of "The Actinic Practitioner and Electrotherapist," a professional journal for practitioners and those engaged in the administration of actinotherapy, medical radiology and electricity, has just come to hand. The purpose of this journal may best be defined by quoting from its editorial columns:—

"Under medical direction and supervision it will seek to deal, month by month, with the progress of these and allied matters, to give practical help to its readers in their technical and other difficulties, and, in short to provide a professional journal which will be valuable not only to those interested in theory, but to every person legitimately practising these new branches of medical treatment."

The first number contains authoritative articles on such subjects as:—The Position of Electricity in Medical Practice, Elements of Practical Actinotherapy—The Choice of Lamps, Starting and Equipping a Small Sunlight Clinic, and Simple Physics of Actinotherapy.

It is intended to issue the journal monthly—the subscription rate for India is seven shillings per annum, post paid. Further information is obtainable from:—The Manager, The Actinic Practitioner and Electrotherapist, 139, High Holborn, London, W. C. 1.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co, P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 *including postage, in India. Rs.* 18 *including postage, abroad.*

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

BLOOD TESTS IN RELATION TO BLOOD TRANSFUSION.*

By R. B. LLOYD, M.A., M.B., B.Ch.,
LIEUTENANT-COLONEL, I.M.S.,
Imperial Serologist and Professor of Serology, Calcutta School of Tropical Medicine.

(In this paper the Moss terminology is employed throughout.)

BLOOD tests in relation to blood transfusion interest both the clinician and the serologist. To the serologist they open up methods of wide application, and for the clinician they prepare the way for a successful transfusion. The subject will be treated in this paper mainly from the laboratory side, though brief references to the clinical aspect will be made.

It is of course a truism to say that blood transfusion, after many vicissitudes in its history, is now one of the most powerful means at our disposal in dealing with emergencies of many kinds. There are conditions in which it is hardly worth while wasting valuable time in the application of other modes of treatment. There is nothing more dramatic in the whole of medicine than to witness a technically correct blood transfusion with a donor of the correct group given to a patient who is *in extremis* from grave hæmorrhage, and to see the extraordinary rapidity of the return to a condition in which the patient is out of danger.

The indications for blood transfusion fall into four well-defined groups. (1) The acute anæmia caused by sudden and grave hæmorrhage, chiefly illustrated by war casualties, post-partum hæmorrhage and ruptured ectopic gestation. Blood transfusion for these conditions is now invariably employed. (2) Anæmia of gradual onset in which a single transfusion is often of great value to assist a patient in poor condition to withstand the shock of a surgical operation. We may extend this to include the case of patients who are gravely ill from such diseases as kala-azar. Blood transfusion as an auxiliary treatment may enable such patients to react successfully to special drugs which have some degree of toxicity, such as the antimony compounds. Transfusion in this class of case must be used with circumspection as the post-transfusion reactions may be severe. (3) A third group comprises the hæmorrhagic diseases in which transfusion is used partly to replace blood lost, and partly to terminate the hæmorrhage. The best examples of this class are hæmophilia and melæna neonatorum. (4) In general toxæmias of many kinds a blood transfusion may in some cases be a valuable mode of treatment, e.g., very good results have been obtained in sprue. The employment of blood transfusion in the treatment of this class of case is not altogether devoid of risk if the anæmia be extreme.

* This paper was read at a meeting of the Calcutta branch of the British Medical Association on February 8th, 1929.

With this brief clinical note we may now pass to the tests which are applied to the blood of the recipient and proposed donor to determine their compatibility or otherwise.

A study of the well-known table of Moss at once indicates that only by the use of group II and group III stock sera can we assign any given unknown blood to its correct group, for this is the only combination of two from the four available sera which will yield a different pair of agglutination reactions with each blood group. It is evident that the four possible reactions which may occur are as follows:—Both may be positive, in which case the unknown blood is group I. Both may be negative, in which case the unknown blood is group IV. If group II serum yields a positive and group III a negative result, then the unknown blood belongs to group III. If group III serum yields a positive and group II a negative result, then the unknown blood belongs to group II. The isoagglutinins, upon which these reactions are dependent, are part of the chemical make-up of the individual, and remain unchanged throughout life. They are ordinarily of quite low titre, usually about 1 to 30. This fact will be seen later to have important applications. These isoagglutinin sera are fortunately not very susceptible to temperature, and will even act powerfully when infected by heavy bacterial growth, though no one would trust reactions obtained with old sera.

Armed with these two stock sera of groups II and III it is next necessary to obtain suitable specimens of blood to group. The procedure which I have found extremely satisfactory is as follows:—The physician takes to the bedside of the patient two small test tubes. One of these contains 1 c.c. of normal saline, while the other is empty. He obtains 3 to 4 c.c. of blood by means of a syringe from a vein in the antecubital fossa. This is far better than pricking the finger, which painful operation usually produces insufficient blood in an exsanguinated patient. He then ejects the first 4 or 5 drops of blood into the normal saline and shakes up. This gives a suspension of the recipient's cells. The extensive dilution prevents coagulation, but if some hours are to elapse before the grouping tests are done, it is desirable to substitute 1.5 per cent. solution of sodium citrate for the saline. The remainder of the blood is ejected into the dry test tube and allowed to clot. If a donor is available at the hospital he then brings these two specimens from the recipient to the laboratory, and the same procedure is now carried out upon the donor, from whom a somewhat larger amount of blood—8 to 10 c.c.—is withdrawn in the usual way. After coagulation of the blood in the dry tubes, we now have four specimens. We first of all group the recipient's red blood cells by means of stock grouping sera. We then group the recipient's serum by means of cells of known groups which are at hand in the laboratory. These

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

have been previously grouped against other known sera. The advantage of this technique is that in no instance will the report on the blood group be based on negative reactions alone. The group of a person as determined from his cells and from his serum is necessarily the same, except in very rare instances of abnormal types. Finally, as a control of the grouping sera used we test these against cells of known groups.

The same procedure is now carried out with the two specimens from the donor, and if they are of the same group as that of the recipient a direct match is made; i.e., the serum of the recipient is tested against the cells of the donor and *vice versa*. If both these reactions are negative for agglutination, the two persons are of the same group, and their bloods are compatible. It will be seen that we have now performed a very exact experiment. We have determined the groups of the recipient and the proposed donor, and we have confirmed the correctness of the grouping and the absence of abnormal types by a direct match. The above method is by far the best, and should always be employed where practicable. It involves access to a central laboratory with standard grouping sera. The full tests, apart from the Wassermann reaction on the donor, occupy perhaps 30 minutes in addition to the time required for the separation of the serum from the clot.

A second method is the employment of group IV professional donors. In sudden grave emergencies it is a great advantage to the clinician to have at hand known group IV donors whose blood may be transfused at a moment's notice without any reference to the laboratory. Hundreds of successful transfusions by means of universal donors have been performed, usually without any serious degree of reaction. Nevertheless, there are certain drawbacks to their use. It will be seen from Moss' table that while the cells of group IV are compatible with all other bloods, the serum of group IV is not. From the absence of untoward reactions after transfusion of blood from universal donors it may be inferred that the reactions of the serum of the donor are of little importance. The reason for this is not quite clear, though it would appear to be largely a question of dilution. In the normal transfusion of 500 c.c. into a patient whose total blood volume is approximately 5,000 c.c. the iso-agglutinins of the transferred serum are quickly diluted to 10 per cent. of their former titre. The titre of these agglutinin sera being usually low, the dilution is believed in large measure to prevent the occurrence of serious reactions which might on theoretical grounds be expected. It may be doubted whether this explanation is entirely adequate, and it has been suggested that the recipient can without disturbance absorb the disintegration products of his own cells which will result from the transfusion of an incompatible serum, whereas he cannot without disturbance absorb the disintegration products of foreign cells. Should, however, the iso-agglutinin titre of a particular group IV serum be abnormally high, then it may still be extremely active even after dilution by the blood of the recipient. This factor is believed to explain the occasional occurrence of severe reaction after transfusion of blood from group IV donors. It will be seen, therefore, that there is a slight risk in the employment of a group IV universal donor who has never given blood before. If he has given blood before without bad results he is safer as a donor, though even here all his previous recipients may have been of group IV in which case no reaction would manifest itself.

If a universal donor is used at all, it is preferable always to employ a direct match as well. In this case, if the recipient is not group IV there will necessarily be some agglutination of the recipient's cells, though not of the donor's cells. The lower the red count of the recipient the more marked will the effect of the transfused serum be; so an important practical point is that in a patient whose red count is very low the use of a universal donor is not desirable, and a donor of the recipient's own group should be chosen. If we transfuse a patient with another blood of the same group we are injecting into him something very like his own blood. Universal donors often answer well enough in emergency transfusions for sudden hæmorrhage, but in old-standing anæmias where a transfusion always involves some degree of risk, universal donors should not be employed. Fortunately, in these cases there is always ample time to obtain a donor of the same group. As the use of blood transfusion has extended, there has been a tendency for the universal donor to drop out. I do not personally pass any donor as suitable unless he is of the same group as the recipient, and as I have on my register donors of all four groups, there is no object in using a universal donor.

Instances may occur where there are no facilities for grouping and no universal donors. The compatibility or otherwise of the bloods of the recipient and the proposed donor may then be ascertained by the direct matching process described above. This method will not identify the groups, but will show compatibility or otherwise. If absolute reliance is to be placed on this test, it is important to carry it out doubly; i.e., donor's cells against recipient's serum and *vice versa*. It is also desirable to repeat the test. Although this test is quite simple, it is, I think, doubtful whether physicians who have not had much laboratory experience would care to trust it absolutely where so much is at stake.

Although both grouping and direct matching should always be performed where possible, it is safer to depend on a direct match alone than on grouping alone, as direct matching has the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

great advantage of showing up an abnormal type which grouping may fail to detect.

Coca has criticised the ordinary grouping tests on the ground that they are somewhat artificial, and that they are not quantitative. He has introduced an ingenious technique whereby the citrated bloods of the donor and recipient are mixed together on a slide in such proportions that the test carried out *in vitro* approximates very closely to the actual state of affairs produced by a transfusion. The dilutions are made by means of a hæmocytometer white cell counting pipette. Having washed this out with ten per cent. sodium citrate solution leaving the terminal 1|10 division filled with the citrate solution, the end of the finger of the recipient is pricked and a large drop of blood obtained. Into this the pipette is inserted and the blood drawn up to the 1 mark. It is then immediately blown out on to a slide, and gently stirred with the end of the pipette. This then is the undiluted blood of the recipient. For the purpose of the calculation the volume of the citrate is neglected. After washing out the pipette and again leaving the terminal 1/10 division filled with citrate, the finger of the donor is pricked and his blood is drawn up to the 1 mark. This is ejected as before on to a second slide. But in this case only nine-tenths is ejected, leaving the terminal 1/10 division filled with blood. Saline is now drawn up to the 1 mark. This second dilution is now blown out on to a third slide and well mixed with the end of the pipette. This provides a one-tenth dilution of the donor's blood, the volume of the citrate solution again being neglected. Now three divisions of the recipient's blood and three divisions of the one-tenth dilution of the donor's blood are drawn into the pipette and blown out on to a fourth slide and well mixed. A cover glass is then put on and the specimen watched for agglutination under the microscope. It will be seen that this technique mimics an actual transfusion of 500 c.c. into a patient who has the average blood volume of 5,000 c.c. It further has the advantage that one can often judge from the specimen whether, in the case of incompatibility, it is the donor's or the recipient's cells which are being agglutinated. While the method is a useful technical improvement in that it provides a quantitative direct match of whole bloods, I have not found the results quite so sharp as those yielded by grouping sera.

Coca subsequently modified his technique using one per cent. sodium citrate solution instead of ten per cent., and diluting in turn both the recipient's and donor's bloods with equal volumes of this weak citrate solution. He then mixes two divisions of the diluted donor's blood with ten divisions of the diluted recipient's blood. The mixture is then watched for agglutination under the microscope as before. With these dilutions the agglutination of an incompatible blood is much more easily seen.

I shall only refer very briefly to the communication of disease by blood transfusion. No guarantee can ever be given that the donor is free from all disease, though every effort is of course made to choose absolutely healthy persons. The most important disease is syphilis. Every donor should have his Wassermann reaction done. This is a great protection, but since there is no stage of syphilis, other than the secondary, which gives 100 per cent. of positive reactions, it follows that a negative Wassermann reaction is not absolute proof of the absence of syphilis. There are several instances in the literature of the communication of syphilis by transfusion. Malaria too is important. In one very successful transfusion here in Calcutta for which I performed the blood grouping tests, the only available donor of the correct group was a man who said he had been subject to fever but had not had any lately. He had never had syphilis, and as the patient, who was his sister, was dying from hæmorrhage, he was used without loss of time. Fifteen days later, when the patient had practically recovered, she had a rigor, and her blood was found to contain large numbers of benign tertian parasites. The fever was quickly controlled by quinine. I suppose that kala-azar could be transmitted by blood transfusion, though one has never heard of it. The question of the health of donors is a very important one. Common sense will suggest the rejection of all donors, who are feeling even slightly unwell, as they may be in the early stage of one of the specific infectious disorders, e.g., measles, which may thus be communicated to the recipient. In this connection there are advantages in using relations, if otherwise suitable, as blood donors, as the family may often know more of the donor's past history than he may care to admit to the doctor.

The near relations of the patient are not by any means necessarily of the same blood group. These groups are inherited according to the Mendelian law. I shall not refer to inheritance of blood groups now, but will only mention the special case of the blood groups of infants. The question is often asked as to whether human blood of any group may be transfused into an infant. This is important in the treatment of melæna neonatorum. It had been formerly stated that an infant had no blood group. The matter was fully investigated by Happ in America in 1920. He commenced by testing the reactions of the umbilical cord blood, and found that these seldom corresponded to the reactions of the adult. He found that the serum of an infant's blood will not usually give any reactions for the first month. The iso-agglutinins are usually present in the serum after one year, and are always present after two years. On the other hand, the reactions of the cells appear earlier, so that, determined from the blood cells, the infant frequently does exhibit selective reactions from birth. When the reaction of the serum is added to that of the cells, the definitive

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

blood group is developed which never afterwards changes. Happ's conclusion was that it was unsafe to transfuse an infant with its mother's blood without performing the usual grouping tests. As the blood group of the infant is frequently different from that of its mother, it follows that there is no transference of iso-agglutinins across the placental membranes.

The question is often asked as to what happens if incompatible blood be transfused. It is of course an appalling mistake to make, for which the person who performed the blood grouping tests would ordinarily be responsible. It is known that the result is not necessarily fatal, though it frequently has been so. At the best, such a transfusion is wholly useless, for should the patient survive, the agglutination which takes place in the blood-stream is followed by hæmolysis of the offending blood which is then excreted in the urine. It is important, therefore, always to keep a close watch for hæmoglobinuria after a transfusion. The result of transfusing blood of a wrong group is graphically described by Peterson who has several times witnessed the effect of incompatible blood. Peterson writes as follows:—

"The clinical picture of these reactions is typical. They occur early, after the introduction of 50 c.c. or 100 c.c. of blood; the patient first complains of tingling pains shooting over the body, a fullness in the head, an oppressive feeling about the precordium, and later excruciating pain localised in the lumbar region. Slowly but perceptibly the face becomes suffused a dark red to a cyanotic hue; respirations become somewhat laboured, and the pulse rate at first slow, sometimes suddenly drops as many as from twenty to thirty beats a minute. The patient may lose consciousness for a few minutes. In one half of our cases an urticarial eruption, generalised over the body or limited to the face, appeared with these symptoms. Later the pulse may become very rapid and thready; the skin becomes cold and clammy and the patient's condition becomes indeed grave. In from fifteen minutes to an hour a chill occurs, followed by high fever, a temperature of from 103° to 105°, and the patient may become delirious. Jaundice may appear later. The macroscopic appearance of hæmoglobinuria is almost constant."

Other writers have described cases which exhibited a progressive hæmoglobinuria the patient dying from suppression of urine, the kidneys presumably being blocked by corpuscle debris. The above symptoms are not unlike those of anaphylactic shock, and their recital will, I think, bring home to everyone the grave danger entailed by inaccurate blood grouping tests.

The mode of action of a successful blood transfusion is not fully known. Very probably it may vary in different circumstances. The changes induced may partly depend on whether or not the condition for which it is employed is associated with alterations of the blood volume or not. The most obvious result is the enormous increase in the red count which may often rise to seven or eight times its previous figure. Keynes quotes some cases from St. Bartholomew's Hospital from which I will take one. "A woman aged 42, suffering from pernicious anæmia, was treated medicinally for four months during which time her red count declined from $1\frac{1}{4}$ millions to 429,000. She was then transfused with 400 c.c. of blood, and her red count rose immediately to 967,000. The rise continued steadily, and three months later her blood count was 3,690,000." The standard transfusion being 500 c.c. into a recipient of total blood volume of 5,000 c.c. it is obvious that the action of a transfusion is far more than merely a mechanical process. It evidently acts as a powerful stimulant to the marrow. It is noteworthy that the stimulation is seen in diseases such as pernicious anæmia in which blood transfusion, though highly successful temporarily, is only a palliative. Vital staining by means of brilliant cresyl blue of the blood shortly after a transfusion, shows a large number of erythrocytes which exhibit a fine blue skeined reticulum. These cells termed reticulocytes are present in normal blood in a proportion of less than one per cent. They are believed to be an index of marrow activity, and reach their highest proportion in hæmolytic jaundice in which they may form twenty per cent. of the total erythrocytes.

It is believed that there are only four blood groups, though recent work by Guthrie and Huck has suggested the possibility of more. These are mainly types in which the serum reactions place the individual in one group while the cell reactions place him in another. In the opinion of Landsteiner, probably the greatest living authority on this question, it is premature at present to postulate the existence of more than four blood groups. This subject is a difficult one, but probably the instances given by Guthrie and Huck are best looked upon as abnormal types.

The blood groups being inherited characters met with in health are thus an expression of basic physiological pattern, and, although not strictly the subject of this paper, we may enquire whether the possession of a particular blood group implies any special immunity from or liability to disease. There is not as yet very much information on this point. Evidence has been adduced that the inherited ability to produce antibodies, especially against diphtheria, is coupled with the blood group. Fürst has reported that the predisposition to goitre appears in the child which inherits the blood group of the affected parent. The children belonging to the blood group of the healthy parent are free from goitre. This rule worked out correctly in 36 out of 39 cases.

Investigations were carried out by Raphael and others to examine the association, if any, between tuberculosis and blood groups. They found that the percentage relations of the blood groups in 400 cases of this disease

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

exhibited no definite difference from those of healthy controls. The interagglutinability of maternal and fœtal blood has also been examined in relation to eclampsia and other toxæmias of pregnancy. No association has been established. Weitzner reported on a series of 84 cases of carcinoma examined against 1,000 controls, and found that blood group I seemed to indicate a predisposition to, and blood group IV a resistance to carcinoma. Similar results were obtained by Bendien who examined 110 cancer cases. These results were not confirmed by Schiff, who pointed out the liability to pseudo-agglutination in carcinoma. This brings us to the question of whether any change ever occurs in an individual's blood group. First as to the changes produced by transfusion. Apparently the blood group of an individual is never changed by a transfusion, though a change of unexplained nature may occur in some cases whereby the blood of a donor found suitable for a first transfusion yields a serious reaction when used a second time for the same recipient. This is apparently due to anaphylactic sensitisation against the blood of a particular individual, and in cases where repeated transfusions are required this possibility should be recognised and met by the use of a different donor each time.

It is also important to know if an individual's blood group may be changed by disease. This is a somewhat difficult question as the blood of patients suffering from certain diseases, particularly pernicious anæmia, frequently exhibits a marked tendency to irregular reactions, i.e., the serum may appear to belong to one group and the cells to another. This is believed to be due to the presence of additional factors termed minor agglutinins, rather than to a change of group. With these cases the so-called universal donors may be totally incompatible.

It will now be seen why so much stress was laid in the earlier part of this paper on the importance of direct matching, especially in transfusions for diseases as distinct from those required to combat the effects of sudden hæmorrhage. There was a tendency a few years ago to regard blood groups as a small and finite subject, but recent research has placed us in possession of an abundance of new facts some of which are hard to explain, and the indications at present point to very wide ramifications into the field of disease. Meanwhile, when testing donors as to the suitability of their gift blood, we shall be wise to remember the adage "safety first"; and the sum of the whole matter is this:—Do grouping tests in addition if possible, but never omit the direct match which is the essential test. It must be recognised that the use of a universal donor without a direct match in the transfusion of cases of pernicious anæmia involves a considerable degree of risk.

I have referred in this paper to the blood tests necessary to ensure a safe blood transfusion under the ordinary conditions of civil medical practice. I may conclude with a word as to their application to military surgery. In the next war, if there ever be one, blood transfusion will play a very important part indeed. Blood grouping tests, we have seen, are not absolutely necessary, and are somewhat time-consuming. These would be discarded in the stress of dealing with large numbers of wounded. Direct matching tests, while always desirable, are not so urgently necessary where healthy recipients are concerned; and where the pressure upon a military hospital after an action is very great, they might also have to be discarded. Probably the most workable arrangement will be found to be the provision of large quantities of citrated blood from known group IV donors before an action, and the transfusion of this without any further tests. Fortunately, the occurrence of high serum agglutinin titre in group IV donors is very unusual, and this slight risk would in the special conditions have to be run. Direct matching tests should, of course, invariably be performed where possible, but in the stress of dealing with a large number of casualties the military medical officer would be perfectly justified in omitting them and placing sole reliance on universal donors. Under these conditions the advantage gained by more elaborate tests might be more than counterbalanced by the loss of time involved.

REFERENCES.

Bendien, S. G. T. (1926). *Nederland Tijdschr v. Geneesk*, 1, 2856.
Coca, A. F. (1918). *Journ. Immunol.*, 3, 93.
Coca, A. F. (1925). *Essentials of Immunology*, p. 140.
Fürst, T. (1925). *Munch. Med. Woch.*, 72, 474.
Guthrie, C. G. and Huck, J. G. (1923). *Bull. Johns Hopkins Hosp.*, XXXIV, 37, 80 and 128.
Happ, W. M. (1920). *Journ. Exp. Med.*, XXXI, 313.
Keynes, G. (1922). *Blood Transfusion*, p. 54.
Landsteiner, K. and Witt, D. H. (1926). *Journ. Immunol.* 11, 221.
Peterson, E. W. (1916). *Journ. Amer. Med. Assoc.*, LXVI, 1291.
Raphael, T. Searle, O. M. and Horan, T. N (1927) *Arch. Int. Med.*, 40, 328.
Weitzner, G. (1925). *Med. Klinik*, 21, 1960.

GASTRIC SYPHILIS.

By E. W. C. BRADFIELD, C.I.E., M.S., F.R.C.S.,
LIEUTENANT-COLONEL, I.M.S.,
From the Surgical Department, Madras,
and
A. VASUDEVAN, M.B., B.S.

GASTRIC syphilis is a rare condition and specific infection has very little influence on the production of gastric or duodenal ulcers. A rough guess at the incidence of syphilis among the general Madras population can be made by a review of the Wassermann results of all patients admitted to a general surgical ward. During the last quarter, of 367 consecutive admissions, 27 patients or 7.6 per cent. gave a strongly positive Wassermann reaction as against 2 or 3.1 per cent. in 67 admissions for gastric and duodenal ulcer for the same period. In my series of over 600 operations for ulcer, in only three patients did the infection appear to be definitely syphilitic, although anti-syphilitic treatment is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

given and does undoubtedly influence the after result in cases in which there is a strongly positive reaction.

The first case revealed a typical leather bottle stomach at operation, and in which a difficult gastro-enterostomy was completed to relieve the obstruction and because the condition did not appear to be malignant. The routine blood

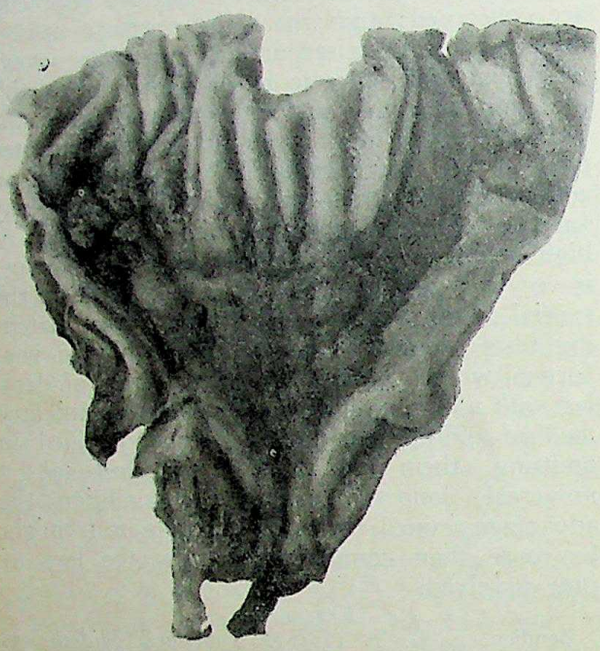


Fig. 1.—Pyloric portion of stomach. Note the large multiple, irregular ulcers; great thickening of submucosa and the stenosis.

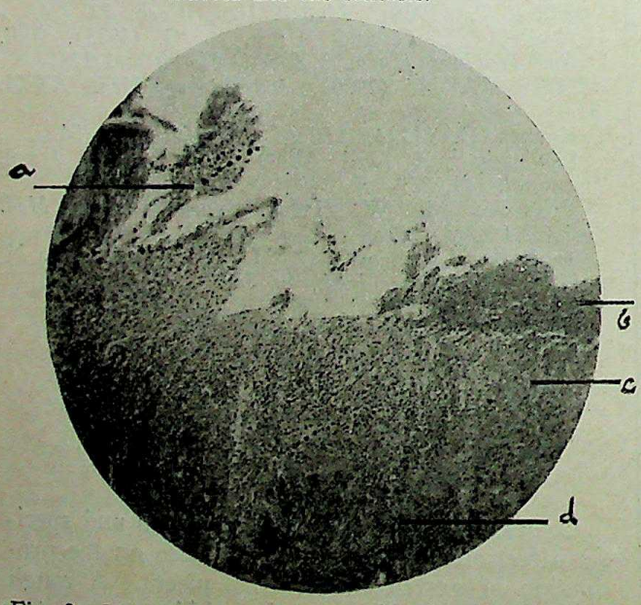


Fig. 2.—Low power view of the ulcer. Note (*a*) the mucous membrane, (*b*) fibrin deposit over ulcer, (*c*) granulation tissue, and (*d*) submucous layer.

examination suggested an anti-syphilitic line of treatment and salvarsan induced a rapid cure. The second case was an ill-developed boy of about 19 who was operated on for a definite duodenal ulcer. A second operation was necessary to deal with a jejunal ulcer, which was apparently recurring when anti-syphilitic treatment, again suggested by the routine blood examination, produced a very rapid cessation of symptoms. The appearance during operation in this case was not at all like syphilis and the influence of the infection is only suggested by the marked result of treatment.

The third case is worthy of a more detailed description. The patient, aged 40, was admitted for pain after food, and a diagnosis of ulcer was made. The pain came on two hours after food, was very regular and relieved by vomiting. There was marked tenderness and rigidity in the upper right rectus and visible peristalsis was present. The patient was in considerable pain and as a pyloric obstruction was obvious, an early operation was recommended and was performed two days after admission. A cardiac murmur was pronounced by the physician to be functional in character, but, as the patient's general condition was poor, the whole operation was performed under local infiltration anæsthesia. There was some free fluid in the abdomen but no adhesions or signs of cancerous or tuberculous deposits in the peritoneum. What appeared to be soft colloid cancer involved the last three inches of the pylorus. The growth had invaded the whole circumference of the stomach, causing almost complete stenosis, but stopped completely at the duodeno-pyloric junction. There were several glands in both the greater and lesser curvatures. A partial gastrectomy (Polya) was completed well away from the margin of the growth.

The post-operative course, which was uneventful, included after the pathologist's and Wasser-

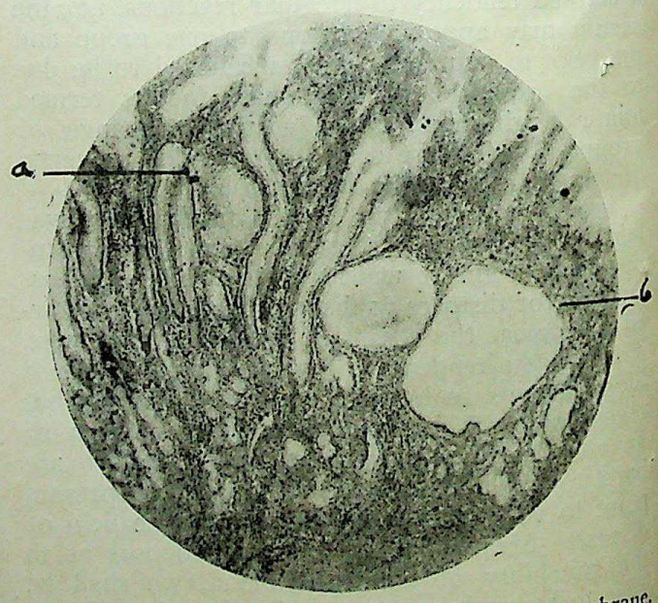


Fig. 3.—Low power view of the mucous membrane. Note (*a*) the hyperplasia of the glands, and (*b*) the cystic dilatation.

mann (strongly positive) reports had been received, anti-syphilitic treatment, and the patient left hospital apparently cured.

PATHOLOGIST'S REPORT.

The specimen is a portion of stomach with thickened and fibrosed submucous coat. There are four large irregular ulcers involving the mucous membrane, one of which measures

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

5 cm. by $\frac{3}{4}$ cm. The edges of the ulcers are irregular and sloping in, the base is smooth, pale, and apparently formed by the submucous layer. The mucous membrane between the ulcers is red and inflamed and the rugæ of the remainder of the specimen are hypertrophied.

Microscopical Appearances.

The mucous membrane is thickened, its glands hypertrophied and several large cystic dilatations are seen in the section. At one part there is an ulcer, the base of which is formed by the submucous layer and is covered by a layer of fibrin, in whose meshes are many leucocytes and red cells. Below this the tissue contains numerous young fibroblasts and small capillaries with marked cell infiltration. The cells are mostly small round cells, plasma cells, endothelial cells and numerous eosinophile cells, though immediately below the fibrinous layer polymorphonuclears are also seen. The entire submucous layer is very much thickened (nearly thrice the normal) and consists of dense masses of fibrous tissue in which the lymphoid tissue is normally represented. Throughout the submucosa there are numerous arterioles with marked periarteritis and periarterial cell infiltration. On examining these vessels under the high power, the majority show a hyperplasia of the adventia and to a certain extent of the media, while generally the intima is normal. Here and there are seen a few arteries with obliterative endarteritis. The cells grouped outside the vessels are mostly round cells and eosinophile cells but there are also a few endothelial cells. The muscular layer is normal in thickness but also shows marked round cell and eosinophile cell infiltration. The serous coat is slightly thickened but otherwise normal. The chief features of the section are, a chronic ulcer of the mucous membrane, extreme thickening and fibrosis of the submucosa in which

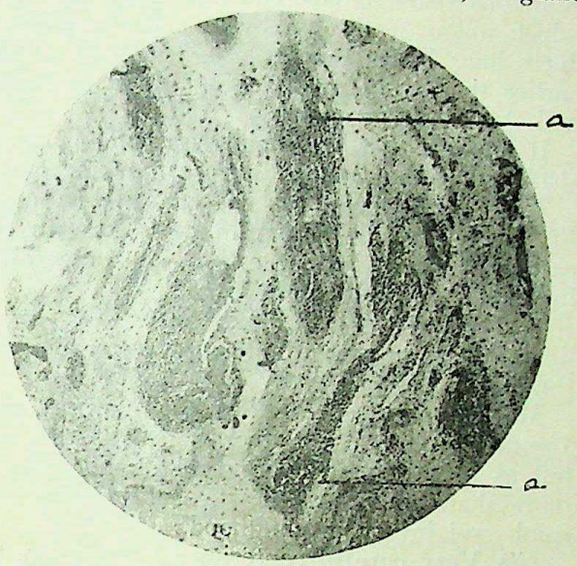


Fig. 4.—Submucous layer. Note (*a*) arterioles with periarterial round cell infiltration.

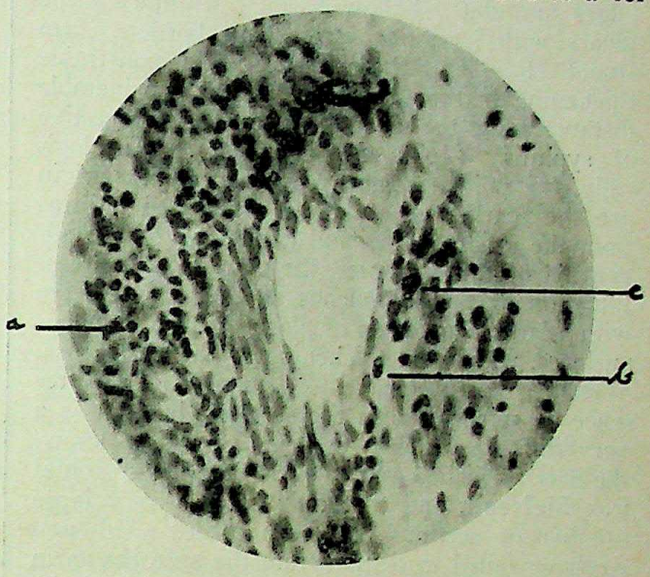


Fig. 6.—An arteriole with periarterial cell infiltration. Note (*a*) mononuclears, (*b*) plasma cells, and (*c*) endothelial cells.

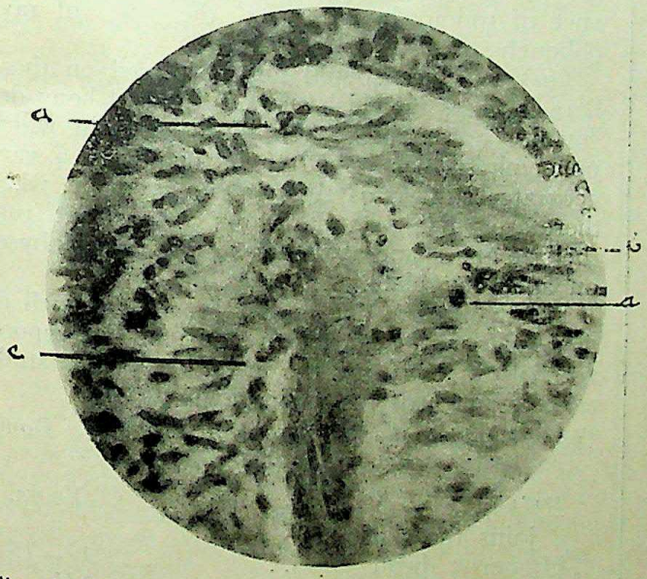


Fig. 5.—High power view of submucous coat. Note (*a*) eosinophile cells, (*b*) mononuclears, (*c*) plasma cells, and (*d*) endothelial cells.

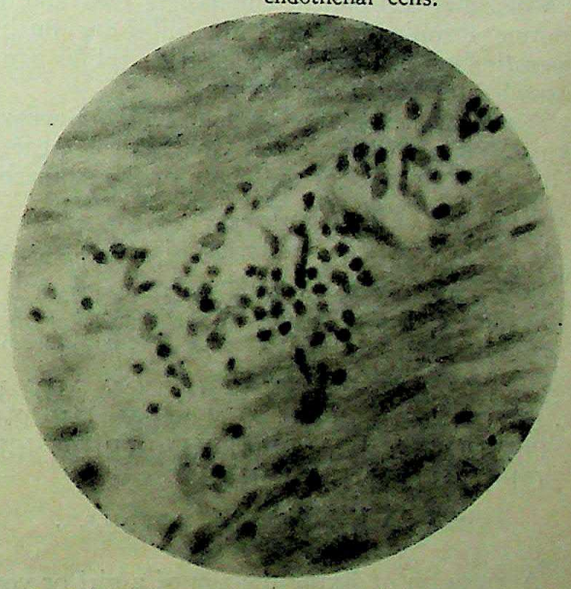


Fig. 7.—High power view of muscular layer showing infiltration with round cells.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the arteries show periarteritis, and marked infiltration of the submucous and muscular coats with mononuclear and eosinophile cell infiltration.

Discussion.—The ulcers are quite unlike the chronic gastric ulcer, which is generally single and has thickened edges. In this specimen, there are four large ulcers with irregular sloping in edges and flat shallow bases. Multiple large ulcers with irregular serpigenous border, firm smooth base and the presence of demonstrable thickening in the stomach wall at a considerable distance from the ulcer itself are very suggestive of syphilis (John A. Hartwell). Histologically, the points suggestive of a syphilitic origin are the marked perivascular round cell infiltration, the inflammation and thickening of the adventitia of the arterioles, the marked cellular infiltration of the submucous and muscular layers with a large proportion of plasma cells and mononuclears, with great thickening of the submucosa. We have not been able to demonstrate the presence of spirochætæ in the sections, but this is a very difficult problem and so far as we know, the only published case in which they were found was McNee's, and that only after a very large number of sections had been made. Although we have failed to demonstrate the spirochætæ in sections, we consider the features both naked eye and histological are highly suggestive of syphilis.

Clinically, this patient emphasises the value of routine examinations and the difficulty during operation of distinguishing gastric syphilis from a moderately early carcinoma.

We are indebted to Captain T. W. Barnard, M.S.R., F.R.P.S., Radiologist, Government General Hospital, Madras, for the photo of the stomach.

REFERENCES.

1. Prof. John A. Hartwell, M.D. *Annals of Surgery*, Vol. LXXXI, April, 1925.
2. *The Lancet*, 3rd December, 1921, p. 1159.
3. McNee, J. W. Syphilis of the Stomach. *Quart. Jour. Med.*, Oxford, 1921-1922, Vol. XV, pp. 215-226.

ON THE DETERMINATION OF AGE IN INDIANS, FROM A STUDY OF THE OSSIFICATION OF THE EPIPHYSES OF THE LONG BONES.

By S. M. HEPWORTH, M.B., D.M.R.E., MAJOR, I.M.S.

A METHOD of fixing the age of a girl or youth accurately and definitely is of use in medico-legal practice; whilst most methods are merely an expression of opinion at best, a method in which the condition of the epiphyses of the bones is actually seen on an *x*-ray plate is definite and scientific.

The determination of a standard for such a method is rendered difficult in India, because of the common lack of knowledge of the actual year of the birth, so the material for this study has been drawn from a few cases where the birth has been registered, and from the inmates of certain mission schools where the date of birth of the pupils is known with fair accuracy.

Those cases in which the epiphyses show a marked divergence in development from the average of those of a supposedly similar age, have been rejected, and the average age at which ossification occurs in the long bones is shown in the accompanying table.

From the examination of the joints of a large number of young Indians between the ages of 8 and 18 years, I have concluded that the age at which union of the epiphyses and the shafts of their long bones takes place, is 2½ to 3 years earlier than the corresponding union in English and American peoples.

It appears that the epiphyses unite with the shafts somewhat earlier in girls than in boys.

Those bones have been chosen for this purpose of which a good radiogram can be taken with ease, and in making the examination the following points must be observed:—

(*i*) Pictures of the six main joints of the limbs, taken in a true antero-posterior direction, should be made in every case.

Marked divergences from the normal occur frequently in one or other bones of the body, but as a rule such divergences do not occur in more than one joint, and probably result from epiphyseal injury in childhood.

(*ii*) Very careful centering of the *x*-ray tube over the epiphyses is necessary, as it is quite easy to give an ununited epiphysis the appearance of union by directing the cone of rays obliquely.

(*iii*) Reliance should not be placed on those data in cases in which there is marked bony deformity in the body. In those cases in which no epiphysis has joined to its diaphysis, a very accurate estimate of the age can be made, when there are reliable standards for comparison, from the size and shape of the shadow of the epiphyses on an *x*-ray plate.

My thanks are due to Dr. H. M. Caldwell of the American Presbyterian Mission, Ferozepore, for help in obtaining the material for this study and for much of the radiography.

*Age at which the Epiphyses of the Long Bones join to the Diaphyses in Indians.**

Epiphysis joins the shaft at—	*Years.*
Humerus, head	17—18
lower end	14½
ext. condyle	14—15
Radius, head	14—15
lower end	16—17
Ulna, lower end	16—17
1st metacarpal base	16½—17½
Femur, head	15½—17
lower end	16½—17½
gt. trochanter	16—17
Tibia, upper end	16½—17½
lower end	16—17½
Fibula, upper end	16½—17½
lower end	17—18

* Based on observations in 83 individuals of whom 20 have been rejected.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

RADIOLOGY IN THE DIAGNOSIS OF CHRONIC APPENDICITIS.

By J. H. BARRETT,
CAPTAIN, I.M.S.,
Indian Military Hospital, Quetta.

IN examining the appendix area with the aid of the *x*-rays, the following questionnaire should be gone through.

(1) Is there a spasmodic hour-glass contraction of the stomach?

(2) Is the duodenal cap normal?

(3) Is the cæcum filled in normal time?

(4) Does the appendix fill in 24 hours, (*a*) partially, (*b*) completely, (*c*) completely, but with a backward kink, (*d*) in a segmented fashion?

(5) Does the appendix appear (*a*) with vacuoles, (*b*) with bulbous tip, (*c*) with concretions?

(6) Is the filled appendix (*a*) freely movable or adherent, (*b*) unduly long or unduly short, (*c*) unduly tender?

(7) Does the appendix empty with the cæcum?

(8) Is the filled cæcum tender on palpation or irritable on palpation (T. B.)?

(9) Does the cæcum empty with the rest of the large intestine, or is there an "island" residue at 24 or 48 hours?

(10) Can the coils of the cæcum and ascending and transverse colon be easily moved and separated, especially can the cæcum be displaced inwards?

(11) Has the appendix failed to fill in 24 hours and in addition is the cæcum tender?

(12) Is the large intestine, and especially the region of the hepatic flexure and proximal half of the transverse colon, (*a*) abnormally low, (*b*) kinked or adherent, (*c*) tender at any portion?

Deductions made from the X-ray findings.

The evaluation of each sign indicative of a possible appendicitis is not within the scope of this article. It will suffice to say that the deductions must be made on signs found and not on signs imagined. Neither should the radiologist lay too much stress on the history or on the clinical diagnosis. Where pain or tenderness is present over the filled cæcum he should get the patient (during screen examination) to put his index finger on the spot that hurts most. In simple low colon, it is usually over the hepatic flexure. In appendicitis it is usually over the root of the appendix. In intestinal colic it may be anywhere, though often over the splenic flexure.

Whilst it is not actually claimed that the *x*-ray will diagnose all cases of chronic appendicitis when present, I have formed the opinion that it will always help either directly or by a process of elimination, in clearing up a diagnosis if the condition really does affect the large bowel or the appendix.

The reasons why the method is not employed more than it is, are as follows:—(*a*) Certain cases are so blatant clinically that *x*-ray examination is unnecessary as the diagnosis is self-evident.

(*b*) In obscure cases with vague symptoms, the patient and his doctor prefer to wait and see.

(*c*) In cases examined by the *x*-rays the important signs may have been missed, and the unimportant ones given an important place when deductions are made. The result is a faulty opinion.

(*d*) The *x*-ray technique may be faulty. One bad film may render the *x*-ray evidence futile; repetitions are costly, and patients are not desirous of going through the whole procedure again.

It will thus be seen that the actual *x*-ray films must be almost perfect, the screen examinations conducted with extreme care and observation, and I might add that of course the proper time intervals must be observed, and as each examination, screen or film, is made the result must be entered up almost at once, so that errors due to tricks of memory may be excluded.

The most valuable signs of chronic appendicitis when present are:—

(1) Tenderness over a definite 48 hours barium "island" residue in the cæcum. (This points to a pathological condition in that area.)

(2) Appendix tender and kinked backwards.

(3) Tenderness over a definite appendix residue,—when the rest of the barium has left the cæcum.

(4) Imperfectly filled and vacuolated or segmented appendix, or an appendix with bulbous tip.

(5) Marked tenderness over the cæcal region and appendix, when there is still barium present and when it is not found possible to displace the coils of intestine towards the mid-line (in the lying position).

(6) An appendix partially filled which cannot be moved about on palpation in the lying position.

Other radiographic signs may be present and have a certain value and all should be carefully noted when forming an opinion.

Illustrative Cases.

Case No. 1.—Mrs. M. complained of chronic indigestion for 4 years. The tongue was nearly always coated and she was losing weight. She had occasionally vague pain over the right iliac fossa. She complained also of chronic constipation and lassitude.

Radiological findings.—An irregularly filled appendix showed. The appendix kinked and painful on pressure at 24 hours. Forty-eight hours delay in the cæcum. Cæcum adherent.

Operation.—A long, very thick, chronically inflamed appendix with a bulbous tip and bound down by adhesions.

Case No. 2.—M. W. Three years history of discomfort over the stomach and right side, foul tongue, headache, malaise, and constipation. Lack of energy. Clinically there was no tenderness over the appendix.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Radiological findings.—Spasmodic hour-glass contraction of the stomach relieved by belladonna. Stomach normal otherwise. The filled cæcum was tender and there was a residue in the appendix at 48 hours and after all the barium had left the cæcum. Appendix only partly filled and not segmented.

Operation.—Short appendix, adherent, thick, and chronically inflamed.

Case No. 3.—P. S. T. History of periodic violently acute attacks of pain in the stomach followed by vomiting, faintness, and diarrhœa. The attacks came on quite suddenly and never within an hour after taking food. Had six violent attacks in the past 4 months. He was absolutely doubled up with pain. Clinically there was practically nothing to be noted. Between the attacks he was quite normal in every way.

Radiological findings.—Stomach high and hypertonic, duodenal cap not seen. Stomach otherwise normal. Food at the splenic flexure in 3 hours (rapid). Appendix partially filled at 24 hours. The appendix shadow was very markedly segmented, transverse, adherent and tender. Forty-eight hours delay in the appendix and cæcum. Cæcum adherent. The region of the hepatic flexure of the colon and the proximal 3 inches of the transverse colon was bound down to the cæcum and appendix area and could not be mobilized in the lying position. This was specially remarked in the *x*-ray report and adhesions were suggested.

Operation.—Long kinked and very adherent and chronically inflamed appendix. Three definite adhesion bands extending downwards from the hepatic flexure and transverse colon to the ilio-cæcal region (Lane's kink type).

Summary and Remarks.

The *x*-rays will often give the following information:—

(*a*) Whether the appendix is diseased or not.

(*b*) Its position.

(*c*) Abnormally long or abnormally short.

(*d*) Whether adhesions are present or not.

(*e*) That the appendix is normal, and some other condition is present.

X-rays will often indicate to the surgeon—

(*a*) Whether an operation is indicated or not indicated.

(*b*) Whether his incision is going to be a local button-hole one over the appendix area or whether the larger and more central incision is necessary, i.e., in the case of complications or other conditions being present either associated with appendicitis, or due to some separate condition.

(*c*) The presence of bowel kinks and adhesions, or of an abnormally low colon.

STUDIES IN THE TREATMENT OF FILARIASIS.

By R. N. CHOPRA, M.A., M.D. (Cantab.),
LIEUTENANT-COLONEL, I.M.S.,
Professor of Pharmacology,
and
S. SUNDAR RAO,
Darbhanga Research Scholar,
Calcutta School of Tropical Medicine and Hygiene.

FILARIAL infection is very prevalent in India, the endemic area is not only along the sea-coast, but extends for some hundreds of miles inland. Although a complete survey has not yet been carried out for the whole of India, the work done by one of the authors (S. S. R.) shows that in 27 districts in Bengal the population is affected to the extent of 0.7 to 11.4 per cent.; in Behar, Orissa and Chota Nagpur the figures are much higher, going up to 27 per cent. Most of the sea-coast districts of Madras and Malabar are heavily infected and every year a large portion of the population of these areas is incapacitated as a result of this infection. The indigenous methods of treating filarial diseases, especially lymphangitis—which is the type which causes considerable suffering in endemic areas in India—are frequently very drastic. The application of severe counter-irritants, for example scalding by a hot iron, or the application of caustic substances to the enlarged glands or along the inflamed lymphatic trunk, is a fairly common method of treatment. Fasting is frequently enforced on the patient in addition to the above measures. For elephantoid growths, the application of leeches is the chief treatment. Applications of pastes made from the leaves, roots and resinous gums are among the standard methods of treatment in the indigenous medicine for elephantiasis. The formulæ of these are described in detail in many of the books on Ayurvedic medicine.

The modern treatment of filarial diseases is very largely surgical. The medicinal treatment of filarial infection and its manifestations has not been very successful. A perusal of the literature shows that little work has been systematically undertaken in this country to find out an effective treatment for this disease. The only treatment resorted to is symptomatic during the acute inflammatory attack and directed chiefly against the secondary infection. In chronic filarial lymphangitis, the abdominal glands are usually affected; the microfilariæ do not get into the blood-stream and remain confined to the lymphatics. Many of the parasites subsequently introduced by the mosquito do not mature; those that mature lay embryos which work back, cause slight lymphatic obstruction and become secondarily infected. Progress of these cases is slow; only a small percentage, generally not more than 5 per cent., have microfilariæ in the blood. The acute septic cases are secondary to streptococcal or staphylococcal infection in the body. The site of infection depends on whether the mature or the immature worm is the nucleus; a number of these may be present. In both these conditions an effective filaricidal drug would be of immense value. If the adult parasites could be killed as soon as the microfilariæ were detected in the blood, the complications mentioned above could be avoided.

In India a few remedies have been tried from time to time with disappointing results. Rogers (1919-1920) first suggested the use of antimonyl tartrates in the treatment of filarial infections. He tried these compounds in the Medical College Hospital and in the Puri Jail and came to the conclusion that the drug on the whole gave encouraging results. Further work by the late

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

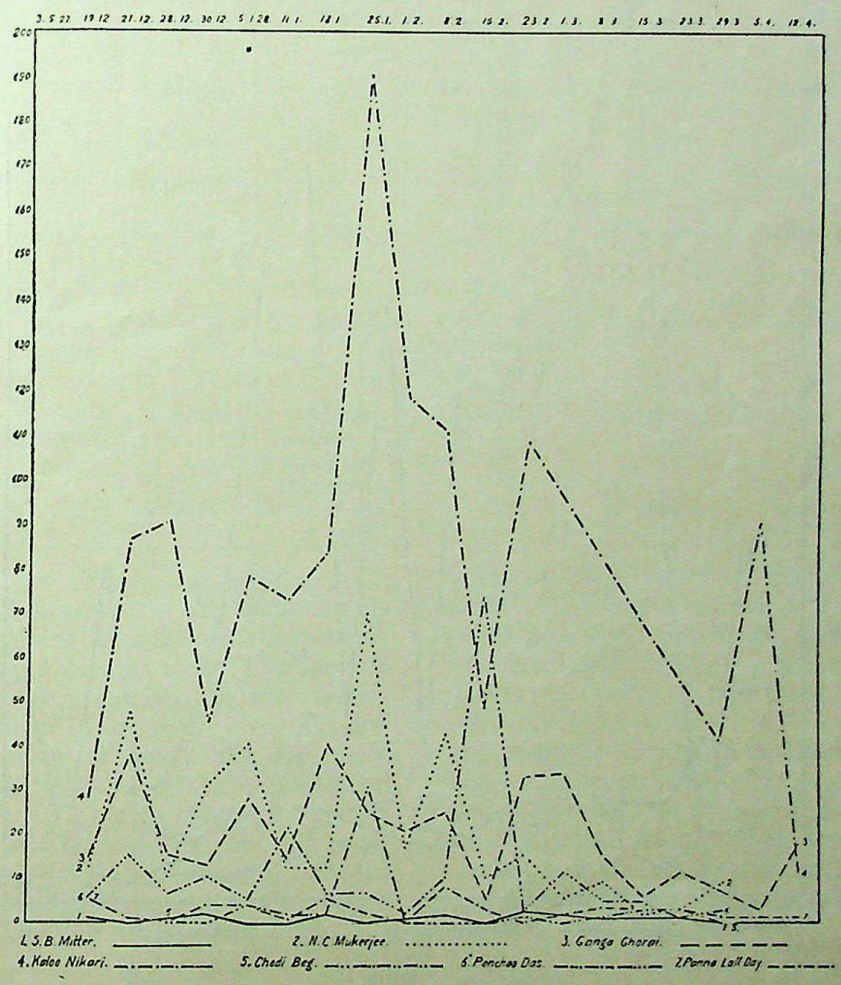
Digitized by Arya Samaj Foundation Chennai and eGangotri

Dr. P. N. Das (1920), Civil Surgeon of Puri, showed that the drug had no marked effect on the microfilariæ, though they often produced beneficial effects on the pathological conditions and clinical symptoms. Various other drugs have also been tried from time to time. Methylene blue, urotropine, quinine, picric acid, various compounds of arsenic (both pentavalent and trivalent), colloidal metals, etc., have been tried, sometimes with apparently beneficial results; even the microfilariæ in the blood are said to have shown a marked reduction. We have noticed that the microfilariæ circulating in the blood show tremendous variations in numbers without any treatment. This is apparent from a study of graphs I and II. If one did not look at the microfilaria count in the control cases, one might be tempted to conclude that the drugs were producing some effect on the embryos.

The Filariasis Commission in British Guiana (1921) tried many preparations, but were equally unsuccessful. Both the adult parasites and microfilariæ appear to be very resistant to the action of medicinal agents whether given intravenously or by other routes. The adult parasites lie in the large lymphatic channels, or in the lymphatic glands, and consequently it is very difficult to get any drug to them in a sufficiently high concentration to kill them. It is well known that none of the drugs are absorbed by the lymphatic route in sufficiently large quantities to produce any effect and hence parasites remain unaffected. The case of schistosoma parasites, which lie in the abdominal blood vessels, is different, as antimony compounds injected into the blood-stream attain a sufficiently high concentration, though it may be only momentary, to have deleterious effects on these helminths.

GRAPH I.

Microfilaria count of persons receiving Bisnene injections.



Another difficulty is that the patients in the majority of instances show little or no symptoms when the adult worms are active and the microfilariæ are circulating in the blood even in large numbers. It is said that only in about 5 per cent. of the cases are any symptoms manifested early; in most of the cases the discovery of microfilariæ is purely accidental. Their effects become evident later when lymphatic obstruction occurs, and are the result of the embolic obstruction, produced not only by the dead worms which obstruct the lymph flow, but

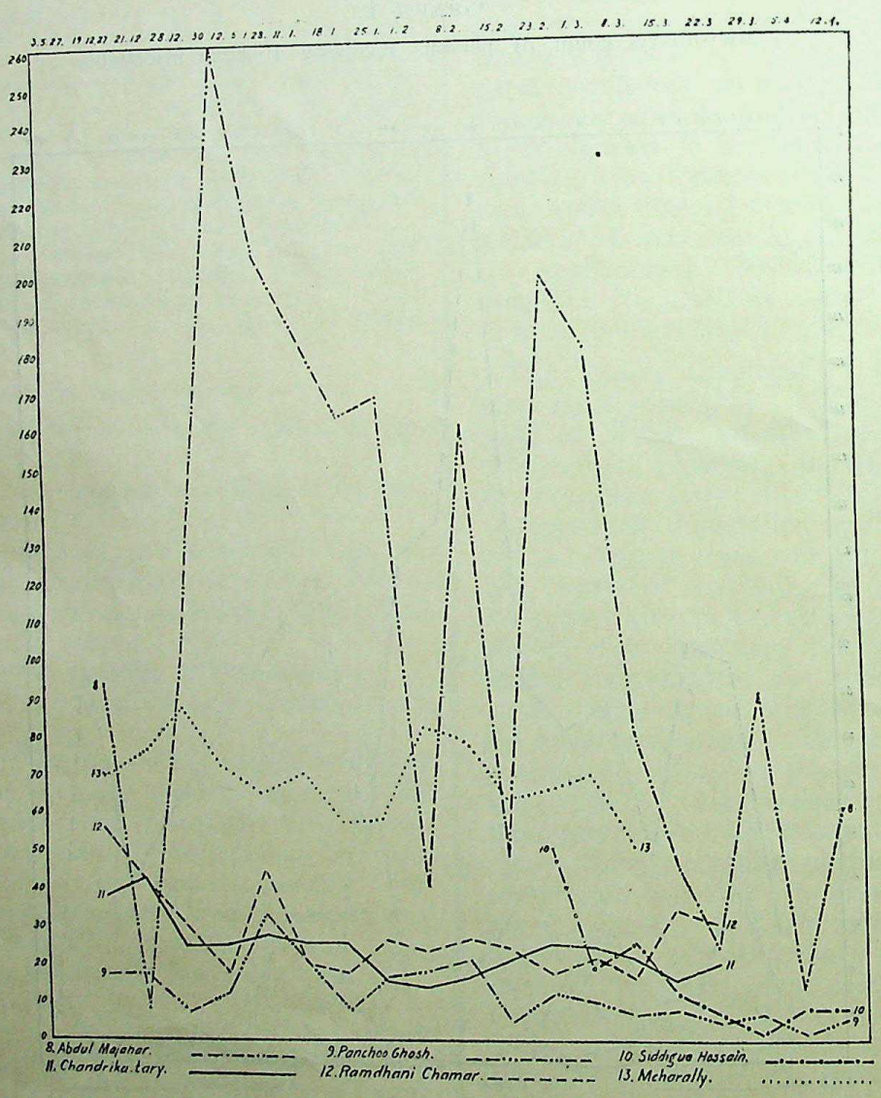
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

sometimes by the inflamed tissues becoming infected with pyogenic organisms and setting up suppuration in the part. As no information is available about the entry of drugs into the lymphatic channels, we decided to try the effect of various remedies given intravenously, or orally, to see if they penetrate there and produce any effects. We thought it might be possible that during the course of these trials we might hit on a drug which would penetrate to the worms in the lymphatics and destroy them. With this object in view, a number of drugs (*vide* Table I) which are reputed to have a well-marked parasiticidal effect in the body were tested. Many of our patients were apparently healthy individuals with no clinical signs or symptoms of filariasis, but who had microfilariæ in their peripheral blood. We thought that any drug producing baneful effects on the adult filaria would adversely affect their embryo producing power. The efficacy of the drug in these cases was, therefore, judged by the effect it produced on the number of microfilariæ in the peripheral blood. Their number per cubic millimetre of the blood was carefully counted before the treatment was started, and counts were made at regular intervals during the course of treatment, and afterwards. By the decrease in the microfilarial count after injections or by their total disappearance it was to be inferred that the drug had some effect either on the adult worm or on the embryos. Where there was no decrease it was to be concluded that the drug had no effect. The patients under treatment had to be kept under observation for prolonged periods. The controls consisted of untreated persons with microfilariæ in the blood who were kept under similar conditions; the microfilariæ in their blood were estimated in the same way as in those under treatment.

GRAPH II.

Microfilaria Count of Control Cases.



Besides taking the microfilaria count of all the patients, both those under treatment as well as the controls, we carefully noted the reactions following the treatment. The urine was also examined for any abnormal constituents. These observations were carried out partly on selected inmates of the Presidency Jail, partly on in-patients of the Carmichael Hospital for Tropical

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Diseases, and partly on out-patients attending the Calcutta School of Tropical Medicine and Hygiene. The following table gives a resumé of the drugs tried and the number of cases treated:—

This drug was tried on prisoners with filarial infection in the Presidency Jail who were otherwise healthy. A close study was possible in these cases and equal numbers of controls were kept under exactly similar conditions. A weekly

TABLE I.

Serial No.	Drug.	No. of cases treated.	Dose.	Route.	Interval.	Total amount given.	Reaction.	Result.
1.	'Bisnene' ..	7	0·1 gm.	Intravenous.	Weekly.	2·75 gms.	Slight.	No effect on the microfilariæ.
2.	'Antimosan' (Von Heyden 661).	3	5 c.c.—8 c.c.	Do.	Alternate days.	60 c.c.	Severe.	Do.
3.	'Stibosan'	5	0·1 gm.	Do.	Do.	3 gms.	Do.	Do.
4.	Neo-stibosan (Von Heyden 693.	2	0 1 gm.	Do.	Daily.	2·1 gms.	Fever.	Do.
5.	'Stiburea' ..	6	0·1 gm.	Do.	Alternate days.	3 gms.	Slight.	Do,
6.	'Novostiburea.	6	0·1 gm.	Do.	Do.	3 gms.	Do.	Do.
7.	'Ant. Sulph. compound'	2	0·1 gm.	Do.	Do.	2 gms.	None.	Do.
8.	'Bayer 205'	2	0·25 gm.	Do.	Do.	2·75 gms.	Slight.	Do.
9.	Mercurochrome.	3	..	..	..	..	..	Do.
10.	Plasmochin.	6	0·2 gm.	By mouth.	Twice and thrice daily for 4 days at a time.	0·38 gm.	None.	Do.
11.	Emetine ..	8	1 grain	2 intravenously. 6 subcutaneously.	Daily.	6 grains.	Do.	Do.
12.	Tryparsamide	12	2 gms.	Intravenous.	Weekly.	12 gms.	Do.	Do.

"Bisnene" (Union Drug Company).

Chemically this compound is the bismuth analogue of urea-stibamine, i.e., the urea compound of para-amino-phenyl bismic acid. Chopra and others (1928) found it suitable for intravenous injection. The initial dose given was 0.1 gm. in 3 c.c. distilled water intravenously, the maximum dose was 0.3 gm. in 10 c.c. of distilled water every week. The drug produced cough, tickling of the throat, swelling of the nasal mucous membranes, chill and sneezing, in the early stages of treatment; later on with larger doses hardly any reaction was produced.

count of the number of microfilariæ circulating in the blood was done both in the patients undergoing injections and in the controls. The urine was examined for any abnormality before and during the course of treatment, and the reactions were carefully watched and noted. There was improvement in general health of all the patients under treatment, chiefly because they were kept under hospital conditions and were not doing hard physical work. The drug had no effect whatever on the embryos circulating in the blood. The details of the results obtained are given in the following table:—

TABLE II.

Bisnene.

Cases.	Age, Race and Sex.	Initial dose gm.	Total amount given.	Reaction.	REMARKS.
I	26 H. M.	0·1	2·775 gms.	Cough, tickling of the throat blocking of the nose, sneezing and chill during the early part of the treatment.	*Vide* Graphs I and II.
II	43 H. M.	,,	2·775 ,,		
III	37 H. M.	,,	2·95 ,,		
IV	42 H. M.	,,	2·25 ,,		
V	35 H. M.	,,	2·775 ,,		
VI	35 H. M.	,,	2·775 ,,		
VII	25 H. M.	,,	2·575 ,,		

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"Antimosan" or Von Heyden 661.

This compound contains antimony in trivalent form. An aqueous solution is neutral in reaction and can be injected intravenously or intramuscularly without pain; it has also been given subcutaneously. The initial dose given was 2 c.c. of a 5 per cent. sterile solution intravenously; the maximum dose was 8 c.c. The drug was given on alternate days, the total quantity given being 20.5 c.c. to 46 c.c. The injections produced severe reactions resembling those of sodium antimonyl tartrate. The details of the three cases treated are given in the following table:—

blood remained absolutely unaffected, but the chyluria cleared up for the time being.

"Stibosan."

"471" (*Von Heyden compound* 471).

This compound is meta-chlor-para-acetylaminophenyl stibinate of sodium and contains 31 per cent. antimony in organic combination; Napier (1927) found it effective against kala-azar. The initial dose given in this series was 0.1 gm. in 3 c.c. distilled water administered intravenously; the maximum dose was 0.3 gm. in

TABLE III.

Antimosan. Von Heyden "661."

Cases.	Age, Race and Sex.	Signs and Symptoms.	Microfilaria Count.			Total amount given.	Reaction.	Remarks.
			Before Tr.	During Tr.	After Tr.			
I	24 H. M.	Chyluria ..	+	+	+	46 c.c.	Severe.	Chyluria cleared up for the time being.
II	40 H. M.	Do. ..	Micro-filaria count per 20 c.mm. of blood 3, 8	2, 12	8, 20, 4	20·5 c c.	Do.	Microfilariæ disappeared from the urine.
III	28 H. M.	Lymph scrotum	Blood—No microfilariæ present. Lymph from lymph scrotum showed microfilariæ before treatment.			34 c.c.	Do.	No appreciable change in the size of scrotal swelling. Lymph could not be examined.

A perusal of Table III will show that in all the patients who had the drug severe reactions, such as rigors, vomiting, rise of temperature, were produced. The embryos circulating in the

10 c.c. distilled water. The injections were given on alternate days or twice a week and produced little or no untoward effects. The results of the treatment are given in the following table:—

TABLE IV.

Stibosan "471."

Cases.	Age, Race and Sex.	Signs and Symptoms.	Microfilaria Count.			Total amount given.	Reaction.	Remarks.
			Before Tr.	During Tr.	After Tr.			
I	20 H. M.	Lymphangitis, right leg.	+	+	+	1 to 15 gms.	Very slight	No effect on the microfilariæ, slight improvement in chyluria.
II	32 H. M.	Lymphangitis, scrotum.	+		+	0·8 gm.	"	
III	19 H. M.	Lymphangitis, right leg.	+	+	+	2·05 gms.	"	
IV	29 H. M.	Chyluria ..	+	+	+	1·75 "	"	
V	26 H. M.	Lymphadenitis, right inguinal region.	+		+	2·95 "	"	

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A perusal of Table IV will show that the drug was tried in five cases, the total amount of the drug administered, varying from 0.8 to 2.95 gm. The embryos circulating in the blood were in no way affected. One of the patients treated had chyluria and in him there was slight improvement; the urine cleared up for the time being, but the chyle soon reappeared. The drug had no immediate or remote effect on the microfilariæ; some of the patients examined months after the treatment still showed microfilariæ in abundance.

"Neo-stibosan," or Bayer 693b.

This compound is para-amino-phenyl-stibinic acid combined with an amine, and is considered by Napier (1927) to be one of the most effective remedies against kala-azar. It was tried in two patients, the initial dose given was 0.1 gm. increased to 0.3 gm. intravenously. The injections were given daily for eight days to get the maximum possible concentration of the drug in the body. A perusal of Tables V and VI will show that the drug had no effect on the microfilariæ in the blood.

TABLE V.

Neo-stibosan "693"

Lukis 2.

Mr. A. S. 46, A I. M.

Admitted on 20-4-28. Discharged on 4-5-28, much relieved.

Date.	Treatment.	Microfilaria count.	Temperature.
23-4-28		3	
24-4-28	(Blood not taken)		
25-4-28	'693' 0·1 gm. I.V.	15 per 20 c.mm. of blood.	
26-4-28	" ·2 " "	17 "	
27-4-28	" ·3 " "	4 "	99·5°F.
28-4-28	" ·3 " "	7 "	100·5°F.
29-4-28	" ·3 " "	3 "	100°F.
30-4-28	" ·3 " "	2 "	
1-5-28	" ·3 " "	10 "	99°F.
2-5-28	" ·3 " "	8 "	98·8°F.

Total 2·1 gms.

Filarial lymphangitis of right leg, attacks off and on for the last 3 years. Leg painful. Relapse, acute attack.

TABLE VI.

Neo-stibosan "693."

Lukis 7. 23-4-28.

Mr. W. L. 45, A. I. M.

Admission 23-4-28. Discharged 12-5-28.

Date.	Treatment,	Microfilaria count.	Temperature.	REMARKS.
23-4-28		4	Normal.	
24-4-28		(Blood not taken)	Do.	
25-4-28	0·1 grm. I.V.	10 per 20 c.mm. of blood.	99°F.	
26-4-28	0·2 " "	4 "	100°F.	
27-4-28	0·3 " "	5 "	101·5°F.	
28-4-28	0·3 " "	0 "	100°F.	Rigor 3 p.m.
29-4-28		0 "	99·5°F.	M. P., negative. Sputum—no acid-fast bacilli.
30-4-28	0 3 " "	4 "	101°F.	
1-5-28	0·3 " "	4 "	100·6°F.	
2-5-28	0·3 " "	3 "	100·2°F.	
3-5-28	0·3 " "	3 "	99°F.	
4-5-28		1 "	Normal.	
9-5-28		4 "	Do.	
10-5-28		2 "	Do.	

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Admitted for filarial lymphadenitis, right inguinal region. Fever off and on for 4 months.

"Stiburea" (Union Drug Company).

This compound has the same composition as urea-stibamine and is a combination of urea with para-amino-phenyl-stibinic acid. The initial dose given was 0.1 gm. dissolved in 3 c.c. distilled water, administered intravenously; the maximum dose was 0.2 gm. in 5 c.c. of distilled water. The drug was given every other day or twice a week and produced very slight reaction; the total amount administered was 1.2 gms. to 2.2 gms.

This preparation was tried in six cases and as all of them were attending the out-patient's department, the examination of the blood could not be carried out as regularly as in the case of patients in the hospital wards. The results given in the following table are sufficiently conclusive to show that there was no effect on the microfilariæ circulating in the blood.

They were present in as large numbers in the blood of the patient after the treatment as before it. Chyluria cleared up with the first two doses of the drug and there was a slight reduction in the elephantoid swelling of the leg after treatment, but these effects were of a temporary nature.

"Novostiburea" (Union Drug Company).

Chemically this compound is a sodium salt of para-amino-phenyl-stibinic and urea. It is said to be more stable and does not decompose on exposure to air and can even stand boiling. The initial dose given was 0.1 gm. in 3 c.c. of distilled water, the maximum dose was 0.4 gm. in. 10 c.c. of distilled water. The drug was given intravenously on alternate days or twice a week and produced little or no reaction in patients; the total amount of drug given was 2.4 to 3 gms. The details of six patients in whom the drug was tried are given in the following table:—

TABLE VII.

Stiburea.

Cases.	Age, Caste and Sex.	Signs and Symptoms.	Microfilaria Count.		Initial dose gm.	Maximum dose gm.	Total gms.	Remarks.
			Before Tr.	After Tr.				
I	30 AI. M.	Chyluria ..	+	+	0·1	0·2	1·6	Chyluria cleared during treatment.
II	19 H. M.	Filarial lymphadenitis, R. Inguinal.	+	+	0·1	0·2	2	Had one attack of lymphangitis during treatment.
III	20 H. M.	Filarial lymphadenitis, epitrochlear gland.	+	+	0·1	0·2	2	
IV	38 H. M.	Filarial lymphangitis, R. leg.	+	+	0·1	0·2	1·2	
V	23 H. M.	Filarial lymphangitis, L. forearm.	+	+	0·1	0·2	2·2	
VI	20 H. M.	Filarial lymphangitis R. leg (eleph.)	+	+	0·1	0·2	2	Slight reduction of eleph. leg.

TABLE VIII.

Novostiburea.

Cases.	Age, Caste and Sex.	Signs and Symptoms.	Microfilaria Count.		Initial dose gm.	Maximum dose gm.	Remarks.
			Before Tr.	After Tr.			
I	17 AI. M.	Lymphangitis, L. leg	+	+	0·1	0·4	Relapses during treatment.
II	32 H. M.	Lymphangitis, scrotum.	+	+	,,	,,	Do.
III	20 H. M.	Lymphangitis, L. leg	+	+	,,	,,	Do.
IV	52 H. M.	Lymphangitis, Eleph. R. leg.	+	+	,,	0·3	No appreciable effect on the Eleph. swelling. Elephantiasis of 32 years duration.
V	30 H. M.	Lymphangitis, L. forearm.	+	+	,,	0·4	
VI	26 H. M.	Lymphangitis, R. leg	+	+	,,	,,	

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The results were not encouraging. The patients under treatment suffered from repeated and severe attacks of lymphangitis, both during the course of treatment and after. The embryos in the blood remained absolutely unaffected. No one of this series of patients suffered from chyluria so that the effects on this condition could not be studied.

Antimony sulphur compound (Union Drug Company).

This is a soluble compound containing antimony and sulphur in organic combination. The initial dose was 0.1 gm. in 3 c.c. of distilled water given intravenously; the maximum dose given was 0.3 gm. in 10 c.c. of distilled water. The total amount given to the patients was 1.7 to 3 gms., injections being given every day. The administration of the drug produced little or no reaction.

only tried in two patients, 0.25 gm. to 1 gm. being given intravenously on alternate days. Only 6 injections of this drug were given, making a total of 2.75 gms. The drug produced rise of temperature and pain in the abdomen, but the urine remained free from albumen. The microfilariæ remained entirely unaffected. Table X gives the details of these cases.

Mercurochrome 220 *soluble.*

This is an organic compound of mercury which can be given intravenously. Chemically it is dibromo-oxy-mercuric-fluorescin. This compound was tried in 3 patients who had embryos in the blood. It was at first given in 2 per cent. solution in doses of 1 to 2 c.c., but it produced marked reactions. We subsequently used a 1 per cent. solution. These were well borne, but the embryos remained absolutely unaffected, even after 10 c.c. doses.

TABLE IX.

Antimony sulphur compound.

Cases.	Age, Race and Sex.	Signs and Symptoms.	Microfilaria count daily.	Total amount.	REMARKS.
I	29 AI. M.	Lymphangitis, R. inguinal region.	44 16 65 18 21 75 125 98 72 12 42 per 20 c.mm. of blood.	3 gms.	No reaction.
II	26 H. M.	F. lymphangitis, Eleph. R. leg.	Mf. before treatment. + Mf. after treatment. +	1·7 „	Do.

A perusal of Table IX will show that the drug was tried on two patients, one being a hospital patient and the other attending the out-patient department. The drug did not produce any reaction, nor any rise in temperature, as is usual

Plasmochin.

This compound is obtained from quinoline and is looked upon as alkamino-6 methoxy quinoline. The drug was given by the mouth, the initial dose given being 0.02 gm. in tabloid form,

TABLE X.

Bayer "205."

Cases.	Age, Caste and Sex.	Signs and Symptoms.	MICROFILARIA COUNT.		Initial dose. gm.	Total amount. gms.	REMARKS.
			Before treatment.	After treatment.			
I	25 H. M.	Nil	+	+	0·25	2·75	No alb. in the urine. Reaction:—Rise of temp. General pain all over abdomen, urine no alb.
II	20 M. M.	Nil	+	+	„	„	

after the trivalent antimony compounds. The effect on the microfilariæ in the blood was entirely negative.

Germanin or Bayer 205.

This drug is a complex organic combination and is believed to be a dye substance derived from amino-naphthalene sulphonic acid. It has well-marked trypanocidal properties. It was

three times a day. The patients were given a first course of 4 days and this was repeated after an interval of rest lasting 4 days. The drug did not produce any untoward effects on any of the patients.

This preparation was also tried in the Presidency Jail, Alipore, on prisoners with filarial infection who were otherwise normal. Twelve cases were selected, six received treatment and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the other six were kept as controls. A careful count of the microfilariæ was made daily of both the batches. A perusal of the table will show that this drug produced little effect on the microfilariæ circulating in the blood.

TABLE XI.

Plasmochin.

Presidency Jail, Alipore.

	Cases.	Microfilaria count with dates.											
		17-4-28	18-4-28	19-4-28	20-4-28	21-4-28	22-4-28	23-4-28	24-4-28	25-4-28	26-4-28	27-4-28	28-4-28
Plasmochin.	1.	2	1	1	1	4	7	6	6	2	0	2	3
	2.	42	2	3	38	24	14	25	28	—	26	26	16
	3.	7	2	7	1	9	4	2	4	4	—	1	0
	4.	0	0	5	0	0	0	0	0	0	1	2	0
	5.	6	14	5	5	8	4	8	2	8	5	5	7
	6.	54	17	21	42	33	36	24	18	47	52	11	13
	7.	3	2	—	0	0	0	1	0	1	—	1	0
Controls.	8.	56	12	42	42	30	18	18	44	18	—	50	26
	9.	8	2	8	3	3	1	3	1	8	—	6	1
	10.	0	0	—	1	1	2	5	0	4	0	0	0
	11.	2	15	4	11	6	12	10	14	—	—	7	3
	12.	1	2	1	1	0	2	1	2	—	—	0	3

Emetine.

The effect of this drug has previously been tested. We tried it in 8 cases. In two of these it was given intravenously and in six by the subcutaneous route; in either case one grain of the alkaloid was given daily till six grains were given. No untoward effects were noticed, but the microfilariæ remained unaffected.

Tryparsamide.

This is a pentavalent compound of arsenic which was developed in the Rockefeller Institute. Chemically it is sodium *n*. phenyl-glycinamide *p*-arsonic acid. The initial dose given was 2 gms. in 10 c.c. distilled water intravenously. Further doses were given every week, the total amount of drug administered being 10 to 12 gms.

A perusal of Table XII will show that the twelve patients treated included those suffering from chyluria, filarial lymphangitis and elephantiasis. Chyluria cleared up completely in every case and the very first dose produced disappearance of the microfilariæ in the urine in 2 cases.

Cessation of chyluria has also been observed with the aromatic compounds of arsenic, such as those of arseno-benzene series, but the effect appeared to be more marked with tryparsamide. This drug is excreted in the urine in large quantities and probably acts by producing absorption of the proliferated endothelial cells lining the lymphatics and thus relieving the blockage to the flow of chyle. It appears to have no specific effect on the diseases, as microfilariæ remain untouched and the elephantoid swellings are unaltered. Tryparsamide undoubtedly decreases

TABLE XII.

Tryparsamide.

Cases.	Age, Race and Sex.	Signs and Symptoms.	Before treatment. Mf. blood.	Before treatment. Mf. urine.	Quantity of drug given.	After treatment. Mf. blood.	After treatment. Mf. urine.	REMARKS.
I	23 H. M.	Chyluria. ..	+	+	8 grams.	+	—	One injection of 2 grams cleared the urine and with it the microfilariæ also disappeared from the urine. Peripheral blood still showed microfilariæ. The attacks of lymphangitis which were recurring were checked in all these patients for varying periods of 1 year and onwards.
II	21 E. M.	Do. ..	+	+	8 ,,	+	—	
III	30 Al. M.	Do. ..	+	+	12 ,,	+	—	
IV	24 Jewess F.	Do. ..	+	+	2 ,,	+	—	
V	18 H. M.	Fil. orchitis ..	not taken.		4 ,,	+		
VI	35 H. M.	Fil. lymph., scrotum.	+		8 ,,	+		
VII	31 H. M.	Fil. lymphangitis, L. forearm.	+		8 ,,	+		
VIII	24 M. M.	Fil lymphangitis, R. leg.	not taken.		2 ,,	+		
IX	19 H. M.	Do. ..	+		2 ,,	+		
X	26 H. M.	Do. ..	+		4 ,,	+		
XI	36 H. M.	Do. ..	+	Lymph.	8 ,,	+	Lymph.	
XII	22 Jew. M.	Lymph., scrotum and chyluria.	+	+	2 ,,	+	+	

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the frequency of the lymphangitis attacks and, therefore, is a drug worthy of further trial.

Summary and Conclusions.

From the data given above we are justified in drawing the following conclusions:—

(1) There are remarkable variations in the numbers of microfilariæ circulating in the peripheral blood; these variations are quite independent of the drug which is being administered.

(2) Bisnene, antimosan, stibosan, neo-stibosan, stiburea, novo-stiburea, antimony sulphur compound, mercurochrome, plasmochin, emetine and tryparsamide produced no effect whatsoever on the microfilariæ circulating in the peripheral blood and, it is therefore presumed, had no effect on the adult parasites.

(3) Tryparsamide, like some of the arsenobenzene compounds, produces disappearance of chyluria, and the effects with this drug often last for prolonged periods. This drug also decreases the frequency of attacks of lymphangitis.

We have much pleasure in acknowledging the help given by Lieut.-Col. N. S. Simpson, I.M.S., Superintendent of the Alipore Presidency Jail, in the course of this research.

REFERENCES.

Rogers, L. (1919). *Lancet*, II, p. 604.
Rogers, L. (1920). *British Med. Journ.*, I, p. 596.
Das, P. N. (1920). *Indian Journ., Med. Res.*, Science Congress Number, p. 44.
Filariasis in British Guiana.—A Report of the Filariasis Commission, 1921, London School of Tropical Medicine, Research Memoir series, Vol. V, Memoir 7, 1924.
Napier, L. E. (1927). *Kala-azar.* Oxford University Press.
Chopra, R. N., Gupta, J. C., and Mullick, M. N. (1928). *Indian Med. Gaz.*, LXIII, No. 7.

BERBERINE SULPHATE IN ORIENTAL SORE.

By A. LAKSHMI DEVI, M.B., B.S. (Punjab).

LAHORE is one of the parts of the Punjab in which oriental sore is particularly prevalent and we have had many cases of this condition. We have until quite recently treated the condition by the application of antimony ointment or methylene blue, and by injections of emetine. These treatments was of long duration and, therefore, very tedious for the patients, and the success was doubtful. Acting on the suggestion of Lieut.-Colonel H. W. Acton, Director of the Calcutta School of Tropical Medicine, we have recently used berberine sulphate injections. This treatment has been really remarkably successful so far; the ulcer heals up as by magic with one or two injections only, and even in cases of long standing a marked improvement is seen a few days after the first injection. Very few need a third injection. The great advantage of this treatment is its cheapness and the ease of administration. We have followed exactly the method suggested by Colonel Acton; the margin of the ulcer is infiltrated by a 2 per cent. solution of the acid sulphate. Details of the doses given in each case and of the progress of the ulcers under treatment are given below.

Case No. 1.—E., aged 8 years.

Ulcer on right arm, 1 inch in diameter, circular, with thin edges. The surface was covered with unhealthy glairy-looking granulation tissue and thin whitish discharge, the surrounding skin was indurated and ½ inch to one side were two nodules pinkish and fairly soft covered with scales. These had existed for one year. On the left fore-arm was another similar ulcer ¾ inch in diameter, of shorter duration.

For 2 months these two ulcers were treated with the usual antiseptic treatment. Magnesium sulphate fomentations were used to clean them, and antimony ointment and methylene blue were applied in turn. The ulcers did not improve and on the right hand appeared two papules, probably secondary infections from the primary ulcers.

1st July, 1928.—The sore on the right arm was injected with 1 c.cm. of berberine sulphate solution. Two days later the ulcer was quite dry and appeared to have contracted in size. There were no constitutional symptoms.

After a week the induration around and the nodules had almost disappeared and the ulcer was covered with thin pink scar tissue. There was no scab on the surface.

10th July, 1928.—A second injection was given into the first ulcer and the ulcer on the left fore-arm was also injected at the same time.

21st July, 1928.—The first ulcer was quite healed, but as the scar was painful a third injection was given.

The second ulcer reacted in the same way and was re-injected.

31st July, 1928.—Both the ulcers were healed; the scars were thin, supple and painless, almost of the same colour as the skin. The nodules on the right hand were next injected: they healed up with one injection.

15th August, 1928.—The patient was discharged cured.

Case No. 2.—M., aged 27 years, mother of No. 1.

On the dorsum of the left wrist was an ulcer a little smaller than a silver two-anna bit. It was covered with a thin scab: the ulcer being shallow and of a uniform pink colour.

The edges were thin and there was not much induration round the sore. Duration 1 year.

Two days after the first injection of 1.5 c.cm. berberine sulphate there was a little swelling round the ulcer, which looked more moist and painful, but in a week it was much smaller, dry, and of a dull pink colour: it was then re-injected. A week later it was completely healed, the scar left behind being hardly noticeable.

As the patient complained of slight pain and swelling in one corner of the scar, a third injection was given on 9th November, 1928; this resulted in a complete cure.

Case No. 3.—R., aged 6 years, sister of No. 1.

A soft coppery papule covered with scales, on left fore-arm. Duration 6 months. 0.5 c.cm. of the solution was injected. Two days later the papule looked much smaller and was dry. It was completely replaced by a painless thin scar in a week. No second injection was given. Another papule of the same nature and duration on the left thigh was similarly cured by one injection.

9th December, 1928.—Returned with an ulcer a little smaller than a two-anna bit on left thigh and ½ inch from the one treated before. It was covered with a typical scab formed of scales and was surrounded by an areola of induration. Duration one month. After two injections of 1 c.cm. of berberine sulphate solution the ulcer was replaced by a pink supple scar.

These three cases occurring in one family may very well illustrate the infectivity of the condition.

Case No. 4.—S., aged 18 years.

A shallow ulcer the size of a two-anna bit on the dorsum of right wrist. The surface was of a uniform

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

pink colour covered with a thin discharge; no induration of the surrounding skin. Duration 1 year.

One week after an injection of 1.5 c.cm. the ulcer was completely replaced by a thin supple scar, without a scab.

A second injection was not given at the time.

9th November, 1928.—A month later a small pimple, size of a pin head, appeared on one corner of the scar and, as it was painful, a second injection was given.

The patient has had no further trouble.

Case No. 5.—R., aged 27 years.

A thick scar, size of a (silver) eight-anna bit, with a red nodule about the size of a pea in the middle; the patient had had Delhi sore for two years. CO_2 snow treatment was tried without much benefit and the patient had then had the ulcer excised. About 10 days after the operation the above nodule appeared and remained small and painful. After one injection the nodule had flattened down and the scar too was less thick and not painful.

After a second injection, a week later, the scar became very thin and pliable.

A month later a third injection was given as the patient was still suspicious of a slight pain on pressure over the scar. This case probably did not react so quickly owing to the presence of scar tissue resulting from the operation which may have had some influence on the penetrating power of the drug.

Case No. 6.—P., aged 23 years.

A small papule on the ankle for two months; after staying with a friend who had a Delhi sore, this papule burst and left an ulcer ½ inch in diameter which is now surrounded by three similar ulcers and an indurated area for about half an inch all round.

3rd November, 1928.—One injection 1.5 c.cm. given.

7th November, 1928.—All the ulcers healed quite well; only the induration being still present.

14th November, 1928.—No induration present. No tenderness. Second injection not given.

Case No. 7.—T., aged 26 years.

Ulcer size ¾ inch by ½ inch covered with thick black hard scab which was very firmly adherent to the underlying tissue. Edges thick and uneven. Dirty thin discharge. An area of induration bluish in colour and covered with scales for about ½ inch all round. The ulcer was situated on the back of the elbow and the bones near by could not be felt due to the swelling.

Duration of the ulcer was two months; it was painless.

24th November, 1928.—Two c.cm. of berberine sulphate injected into the ulcer in 4 places; mag. sulph. fomentations were applied 4-hourly.

29th November, 1928.—The swelling around the ulcer had completely disappeared and the epicondyles of the humerus could be felt. The indurated area round the ulcer also felt softer and less marked.

On removing the scab there was a fair amount of bleeding and the granulation tissue underneath was unhealthy.

2nd December, 1928.—The ulcer was flatter and smaller. No swelling round about, and no induration or discharge.

A second injection was given.

8th December, 1928.—The ulcer much better though not quite healed. A third injection was given; the patient left the station.

11th January, 1929.—The patient returned and the ulcer was quite healed though thick. The same patient had three more ulcers on the right fore-arm. They were all in the papular stage. One was injected and healed with one injection.

Case No. 8.—S., aged 20 years.

A small papule which gradually grew bigger and formed an ulcer on the back of the neck.

Duration three months.

An ulcer about ¾ inch by ½ inch covered with a dry scab formed of scales. On removing the scab the surface of the ulcer was seen to bleed readily and was covered with granulation tissue.

There was an area of induration for ½ inch around.

13th November, 1928.—One injection of 1.5 c.cm. was given in three places.

16th November, 1928.—The ulcer flattened down.

20th November, 1928.—The ulcer looked much better and dry.

Second injection given in four places. Was dressed with boric ointment.

27th November, 1928.—Third injection given. The ulcer almost the same as on 20th November, 1928; dry dressing applied instead of the ointment.

12th December, 1928.—The ulcer covered with scab and smaller.

20th December, 1928.—The ulcer was almost healed.

It may be noted here that our cases do best with either dry or saline dressing.

Case No. 9.—P., aged 28 years.

A typical Delhi sore of six months' duration; partly healed after application of some Indian medicine. No further progress after the ulcer reached the present stage, three months ago.

A red softish and raised area of about the size of a four-anna bit.

No discharge.

3rd December, 1928.—Injection of berberine sulphate given.

10th December, 1928.—The scar darker in colour and quite flat. Second injection given.

17th December, 1928.—The scar looks much darker and quite flat.

Case No. 10.—K., aged 30 years.

An ulcer the size of an eight-anna bit on the back of left calf. It was flat, and covered with unhealthy granulations and dirty discharge. An area of induration for ½ inch all round, not painful.

Duration—two months.

The ulcer did not look like a typical Delhi sore, but the Wassermann reaction was negative.

Three berberine sulphate injections were given, but the ulcer did not show any improvement. This was the only case of our series that failed to improve under this treatment and, as was noted above, it was not a typical oriental sore.

Case No. 11.—B., aged 1 year.

A soft red nodule the size of a four-anna bit on the dorsum of the nose.

Duration—two months.

After the first injection there was considerable reaction and much swelling round the ulcer which subsided after two days. A week after the injection the ulcer seemed better and smaller. A second injection was given but the patient did not return after that.

Case No. 12.—The patient is deaf and dumb and can give no history, but came from an institution where other cases had occurred. Two ulcers the size of a pea on the right arm. The surface was dry and scaly with a small area of induration around ulcers.

14th December, 1928.—One ulcer was injected with 1.5 c.cm. of berberine sulphate solution.

15th December, 1928.—The ulcer was dry and small.

18th December, 1928.—The ulcer still flat and small.

21st December, 1928.—Second injection given.

28th December, 1928.—Ulcer quite healed.

The second ulcer also was cured with two injections.

SUMMARY OF RESULTS.

Thus of the 18 sores treated on these 12 patients, six healed completely with one injection, five healed completely with two injections, five healed completely with three injections, while one improved with one injection but the patient did not return after the second.

One case only failed to show any improvement and in this case the original diagnosis was doubtful.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ON THE ANOPHELINE MOSQUITOES OF HAZARIBAGH (BIHAR AND ORISSA).

By BHUDEB CHANDRA BASU, M.SC.,

Entomologist, Spirochætosis Transmission Enquiry, under Indian Research Fund Association, Protozoology Department, Calcutta School of Tropical Medicine and Hygiene.

DURING October 1926 and October 1928, the anopheline fauna of Hazaribagh was studied, chiefly from the entomological point of view.

Hazaribagh is a large sized town, covering an area of nearly 10 square miles and at an elevation of 2,000 feet above sea-level and lies between 23° 25′ and 24° 47′ N., and 84° 29′ and 86° 38′ E. The average annual rainfall is about 51 inches. The mean humidity is about 51. The day temperature rises as high as 107°F. in summer and falls as low as 40°F. in winter. But the climate is generally temperate. The town is situated on an elevated area and the land slopes away from the town and consequently there is a good natural drainage in the outskirts of the town. There is, however, no proper system of drainage within the town itself, with the result that in the rainy season ample opportunities are afforded for mosquito breeding. Besides there are a few permanent breeding places, namely, the Hazaribagh Lake and the Okni Swamp where mosquitoes probably breed throughout the year. In the low-lying areas around the town several small streamlets flow.

Eleven species of anopheles have been found here, namely:—

Anopheles barbirostris, Wulp,
Anopheles hyrcanus, Pallus,
Anopheles subpictus, Grassi,
Anopheles vagus, Donitz,
Anopheles listoni, Liston,
Anopheles culicifacies, Giles.
Anopheles fuliginosus, Giles,
Anopheles pallidus, Theo.,
Anopheles theobaldi, Giles,
Anopheles maculipalpis, Giles,
Anopheles jeyporiensis, James.

The principal breeding places in the area are (*i*) large swamps, (*ii*) small streams which are very common in the outskirts and (*iii*) seepages which are also common in the outskirts of the town. The Hazaribagh Lake in the north-west and the Okni Swamp on the west of Hazaribagh are two prominent breeding places within the town. From the edge of these swamps to a considerable distance towards the middle aquatic vegetation is very thickly grown. *Anopheles fuliginosus* was found breeding profusely in the Okni Swamp as well as the Hazaribagh Lake. *Anopheles subpictus, barbirostris, hyrcanus* and *listoni* were also found breeding in these two places in October. The small streams at the outskirts of the town were found breeding large numbers of *Anopheles culicifacies* and a comparatively smaller number of *Anopheles listoni*. These streams are evidently responsible for the adult *Anopheles culicifacies* which was caught in the town. *Anopheles theobaldi* and *maculipalpis* were found breeding in small seepages at the foot of the Canary Hill and the Sitagara Hill. Several wells in the town were examined but no larvæ were secured; the upper surface of water in the wells was at a considerable depth from the ground level.

The Okni Swamp.

Adult *Anopheles fuliginosus, culicifacies, listoni, hyrcanus, barbirostris, subpictus, pallidus, vagus* and *jeyporensis* were collected from human habitations and cowsheds in the town.

In the adult specimens of *Anopheles fuliginosus* collected, a few variations were observed. The white area on the hind tarsals varied from 2¾ segments to 3½ segments. In five specimens, instead of three usual palpal bands, four narrow palpal bands were seen. These variations

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

have been previously termed as a winter variation, and described as a variety, namely, *A. fuliginosus* var. *ædei*, but this view is no longer taken. These variations are frequent in *A. fuliginosus*. Some of the adult mosquitoes caught were found infected in the abdominal as well as thoracic regions, with red mites.

The local opinion points to the fact that Hazaribagh was more or less free from malaria a few decades ago and that of recent years, the malaria has been actually on the increase. The opinion of the local medical men, whom I consulted, also supports the view that during recent years, malaria cases have been increasing in number appreciably. The increase has been explained by the return of the coolies who are recruited for working in the tea gardens of the Bengal Duars and Assam, and who invariably returned home with a heavy malarial infection. It is very likely that this is to a large extent the proper explanation of the recent increase of malarial incidence in Hazaribagh. Out of the eleven species of anopheles found in Hazaribagh several species are known transmitters of the malaria infection. When so many of the malaria-carrier species occur in Hazaribagh and since the increase in malaria cases has also been very noticeable, it seems important that a detailed mosquito and malaria survey should be conducted in the town of Hazaribagh and its environs in order to understand the exact state of affairs. The present investigation was carried out during the vacation of the writer and, as such, is far from complete. Such a survey should be conducted to study the prevalence of the different mosquitoes at different seasons and the character of breeding places. The present paper is written with a view to drawing the attention of the public to the possibility of Hazaribagh getting more and more malarious in course of time if proper steps are not taken at an early date. Hazaribagh is an important holiday-centre and a well-known sanatorium, and it ought not to be allowed to become malarious. Since the carrier anopheles as also malarial patients are present in good numbers, it is possible that if the present conditions are allowed to continue, Hazaribagh may at no distant date become as unhealthy as the neighbouring tracts of Singhbhum.

The writer's grateful thanks are due to Mr. M. O. T. Iyengar, Entomologist, Bengal Public Health Department, for his help in connection with this investigation.

The Hazaribagh Lake.

THE FATE OF THE MEROZOITES SEEN IN THE CULTURES OF MALARIAL PARASITES.

By R. ROW, M.D. (Lond.), D.SC. (Lond.), O.B.E.,
Professor of Pathology, Grant Medical College, Bombay.
(*From F. D. Petit Laboratory, Byculla, Bombay.*)

IN another paper, the author of this memoir has described the various steps taken by the malarial parasites of all the three well known species, from the ring stage right up to a mature schizont and sporulator in a successful culture, and no further reference need be made to this beyond stating that the different phases of development (of the rings) not seen in blood films prepared at the bedside, in the case of *Plasmodium falciparum* infection can be studied accurately in cultures and with ease.

From a study of such cultures several factors underlying the variability in the number of spores developed in infections by the same parasite have come to light and these have been also dealt with in another memoir. In this memoir it is intended to indicate in broad terms some of the factors which prevent a successful culture, and the morphological changes which the parasite undergoes even when all the technical details are strictly adhered to. Such morphological changes may also explain not only the failures of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

auto-cultures, but also the difficulties one meets with in attempts to obtain successive generations of the parasite *in vitro,* strongly suggestive of the production of something antagonistic during infection.

The chief enemy the merozoite has to face, as it emerges out of a mature schizont, is the blood serum which strikes at the very root of the parasite's existence, viz., its chromatin, thus rendering it unfit to attack or thrive in a fresh red blood corpuscle. This serum action is seen even in the first culture, and appears as if specific, and one can well expect it to operate much more vigorously in the patient's blood which is being enriched every moment by the antibodies poured in, in response to the reaction of the infection. This antagonistic serum action may also explain why, although it is not unusual to have a recrudescence of the same attack 2, 3 or more times in a patient otherwise healthy, such reaction often comes to an end *per se;* it may also account for the complete want of proportion between the clinical features of each paroxysm and the capacity of the schizont to multiply, and where the yield of potential merozoites, setting up the second and succeeding paroxysm may be reckoned on a basis of 8 to 20 times or more each time. And lastly it explains the identical behaviour of the parasite and its degeneration in culture in an immune serum from a convalescent and in a quininized serum (Fig. 4).

The mature spore in a schizont is a spherical dot of chromatin with a thin rim of cytoplasm, and when it comes into contact with the serum it swells up and the well marked differentiation of these structures becomes confused, the chromatin dot becomes woolly and shows degeneration as seen by its taking up less of the nuclear stain and more of the eosin stain (Fig. 1 A); should the spores escape the action of the serum by their being protected by the remnants of the parent schizont, they are taken up by the phagocytes as are also the whole mature schizonts with their full load of spores, there to undergo the usual digestion and disintegration (Fig. 1 P and Fig. 3). In this process the phagocyte itself undergoes necrobiosis, as is seen by the altered nucleus and cytoplasm, both in structure and its acidophilic staining characters (Fig. 1 P). The merozoites which escape this double process of destruction are probably the ones which attack

Fig. 1.—A 48 hours culture of *P. falciparum* showing schizogony, escape of merozoites into the serum and the effect of serum action, and phagocytosis (*P*).

the fresh red corpuscle, and undergo fresh development into schizonts and sporulators. Such merozoites appear as though they had acquired a new rejuvenescence by passage through the phagocytes; but as indicated elsewhere, schizogony of the freshly infecting parasites becomes each time lessened until a time is reached when one spore is capable of producing not more than one individual and this new direction of development leads to the production of gametes or crescents according to the infecting material (Fig. 2).

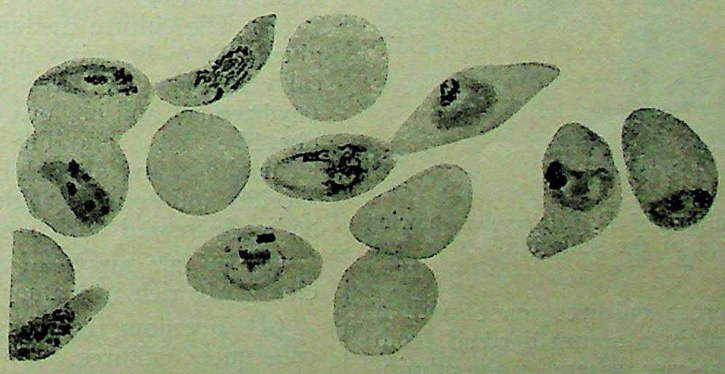


Fig. 2.—A 48 hours culture of *P. falciparum* showing the evolution of the crescents.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

This phenomena comes about, however, only under special conditions, and as a rule in a fresh infection in an individual otherwise healthy the culture both *in vivo* and *in vitro* soon comes to an end. In the latter the dead phagocytes liberate a hæmolytic enzyme, which by dissolving the red blood corpuscles still intact in culture renders the whole tube laky (a sign that all the parasites are reduced to a granular debris interspersed with the persisting hæmozoin, this being the only index of their identity). This hæmolysis seen in a dying culture brought about by the degeneration and disintegration of the leucocytes as seen by their acidophilic stain, may perhaps explain some of the complex phenomena in the hæmoglobinæmia and hæmoglobinuria of blackwater fever, sometimes complicating a malarial infection.

In some individuals with a severe infection the blood is surcharged with rings and here one would expect a rich culture. It is found, however, that far from this being the result, the culture entirely fails, the majority of the parasites dwindling and degenerating. The only explanation of this is to be sought in the powerful antiparasitic qualities acquired by the blood serum, obviously induced in the course of the repeated paroxysms, because in experiments made with cross cultures with an indifferent serum, a better yield of schizonts and merozoites is obtained. Further, this anti-property of the serum is evident in the tendency of the parasite-laden red blood corpuscles to agglutinate in autocultures before they are destroyed by the action of the serum (Fig. 3). A similar agglutination

Fig. 3.—A 48 hours culture of *P. falciparum* showing agglutination of the schizonts.

is demonstrable in cross cultures made with a rich infecting material in a serum derived from a convalescent malarial case, where by the administration of quinine the blood serum is rendered doubly anti-parasitic.

In a cross culture of this nature it is remarkable to see the red blood corpuscles containing the *P. falciparum* rings clumped together in large masses visible even under low magnification; here the parasites show a faint attempt to grow, but ultimately they degenerate. It may be of interest to note that one can obtain very rich cultures of merozoites by planting the parasite into sera

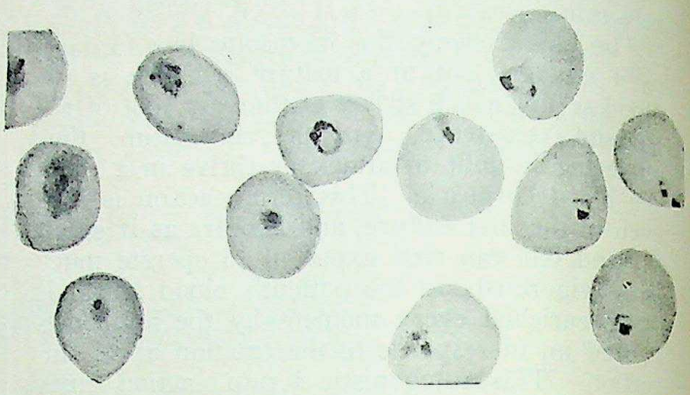


Fig. 4.—(*A*) A 48 hours auto-culture of *P. falciparum* to be compared with (*B*) as 48 hours hetero-culture of the same in quininied serum.

derived from patients with increased leucocytosis, e.g., pneumonia, localised inflammation and leukæmia.

Next to these two main factors, viz., the specific serum action and the phagocytosis, leading to failure of cultures, is the condition of hydræmia with its concomitant anæmia, vacuolation and distortion of the red blood corpuscles. Here the main failure is obviously due to the nutritional deficiency of both the serum, being poor in proteins, and of the red blood corpuscles in hæmoglobin.

Lastly, any obvious toxic contamination of blood serum also leads to a negative culture as seen from a comparison of the results of heterocultures and autocultures with sera derived from jaundice, both obstructive and hæmolytic.

From the above the following preliminary conclusions seem justifiable with regard to the essentials of a successful culture and possibly of a sub-culture:—

(1) A vigorous parasite derived from a fairly fresh infection.

(2) The culture medium (the serum properly glucosed) to be fairly unaltered in its biochemical contents, i.e., free from excess of water (hydræmia) and obvious extraneous toxic bodies like bile salts and bile pigments (jaundice), hæmoglobin and altered H-ion concentration and specific anti-bodies (agglutinins and other anti-bodies increased during each paroxysm).

(3) A fair supply of fresh red blood corpuscles fairly rich in hæmoglobin.

(4) Freedom from leucocytes in the first and subsequent cultures.

(5) A rigid asepsis in all the manipulations.

This memoir is based on an investigation undertaken under the auspices of the Indian Research Fund Association, 1927-1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THE RESPONSE OF A GROUP OF INDIAN INFANTS AND CHILDREN TO THE SCHICK TEST.

A PRELIMINARY REPORT OF 186 TESTS.*

By V. C. RAMBO, M.D.,

Mungeli Area Christian Hospital and Dispensaries, Mungeli, Bilaspur Dist., C. P. (India).

I AM reminded, as I tell of such a few cases and with such little experience with the Schick test, of Dr. John B. Deaver, the Philadelphia surgeon, in whose scintillating lectures we, as students used to sit spellbound. Drawing himself up to his full height he would denounce the ignorant inexperienced physician or surgeon, who talks too much, with the modification of the Litany, "Deliver us from the man who has had a case." However, to begin one must begin and so the following experience and observations are recorded, the first it is believed made on Indian children. Fox, McCombie Young, and McDonald made observations in Shillong on European and Anglo-Indian children, all of the school age. They also found that although the children tested had had among them in former years as many as forty cases in one year, there was no tendency for the disease to spread among the Indian children in an epidemic form although at the same time sporadic cases appeared among the Indian children population (Personal communication from Dr. E. C. R. Fox).

In the report of eleven cases of diphtheria in the Central Provinces, Rambo (1928), the question arises again, why was the spread of diphtheria so limited? It was to throw some light on this question that the 186 Schick tests were done. It has been said that only an expert can accurately judge the results of this test. However, after reading J. D. Rolleston's review of the Schick test in the *Medical Annual*, 1928, and, realizing that there were so many checks upon the tests and also that even an expert in a European country might have difficulty in judging the reactions on the tropical epidermis, it was determined to go ahead.

The Schick test material was obtained in very convenient form from Arnhold and Company, Bombay, agents for Mulford of Philadelphia. Fifty is the number for which each unit of the material is prepared. The control is found in a packet containing one ampoule and the toxin in another packet together with distilled water sufficient to dilute the toxin, together with complete directions.

In the first group of fifty, two Europeans were included so as to get, if possible, the text-book reaction and prove the potency of the material. In the other three groups of fifty, two other Europeans were tested. Fortunately all but one of them gave perfectly unmistakable positive reactions, thus assuring us of the efficacy of the material used.

A few adult Indians are included among those tested, partly for the test's sake and partly because, at the time of injecting the test material, there were no more children to be had. As the material must be used quickly, it was thought advisable to use it up directly. The arguments used to get the village mothers to bring their children and infants to receive the tests would make an article in themselves. Suffice it to mention that at one time victory was snatched out of failure, when the chaprasi returned, saying no one would come, by my assistant going into two sections of the village and urging the mothers to come. The fact that forty-five children and infants appeared at the hospital within an hour of his visit proves a fine sense of appreciation on his part of a new scientific test and also his ability as a leader. Not all our tests could be given in the hospital. The last fifty were given in the homes and again my assistant made possible many tests that were allowed only with the greatest difficulty. They, however, became popular before we finished and one mother came after a group was completed asking that the child be tested also.

Throughout, the toxin was injected into the epidermis of the right forearm flexor surface and the control into the epidermis of the left forearm flexor surface. It might be well to explain that the control contains exactly the same substances as the toxin, except that the toxin was detoxicated by heating as mentioned below.

Quoting from Rolleston in the *Medical Annual*, 1928 "Four varieties of the Schick test are described, viz., (1) Negative; (2) Positive; (3) Pseudo, or negative and pseudo; (4) combined, or positive and pseudo.

1. The *Negative* reaction is a complete absence of reaction.

2. In the *Positive* reaction a red flush appears at the site of intracutaneous inoculation of diphtheria toxin within 24 to 48 hours and reaches its maximum in 40 days, when it forms a circumscribed swollen area measuring 1 to 2 cm. in diameter. It then slowly fades in a further 7 to 10 days to a circumscribed brownish tint with desquamation of the epidermis.

3. The *Negative and Pseudo* reaction develops rapidly both on the arm injected with toxin and on the control arm injected with toxin which has been heated to 75°. By the fourth day the reaction has mostly disappeared, but often leaves a reddish or brownish pigmentation with some desquamation.

4. In the *Positive and Pseudo* reaction the pseudo effect develops rapidly on both arms and as it fades the true positive reaction appears on the test arm.

(1) and (3) indicate immunity, and (2) and (4) susceptibility, to diphtheria."

* Read before the Mid-India Section of the Indian Christian Medical Association, Jubbulpore, C. P., 7th September, 1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Reading the tests.

There was among the younger children and infants not the slightest doubt about which test was positive and which negative. But among the children above three there were some cases that did not show the hearty reaction seen without exception in younger patients. This feeble reaction consisted of a single papule 0.3 by 0.4 cm. that appeared only on the arm receiving the toxin. This papule developed within the first twenty-four hours and disappeared leaving not the slightest sign, except that of the needle prick, by the end of 48 or 72 hours. These were called negative. In these occasional cases truly an expert is needed to pronounce proper judgment. Some of the children were not seen on the fourth day so that the reading made on the second or third day was counted final. This introduces probably a small error. Copeman, O'Brien, Eagleton, and Glenny (1922) made tentative readings in 24 hours in 400 cases and found that 5 per cent. proved later to be incorrect.

Concerning the positive reactions it would be well to say that in the darker epidermis this redness is combined with the degree of darkness of the skin tested in each particular case. In only one case was this reaction not present on the second day following the test. This case developed a positive reaction on the third day and continued the usual moving picture to the end of the test. Instead of the reacting area fading after the fourth day, the test becomes more and more evident, taking on a raised blackish purple colour on the fourth and fifth day and becoming almost a black area on a brown or olive skin by the seventh to ninth. From our experience we would say that this reaction is usually so definite, in younger children especially, that in case the examining physician could see the arm tested once only after the test, the examination at the end of the fourth to seventh day would show every case positive. This agrees with the report of the Schick test given in the Medical Research Council's monograph on diphtheria, page 362. In the children above four later signs of the reaction were not so marked and often did not scale typically and did not leave any hyperpigmentation. The hyperpigmentation lasts in many instances for a month, or longer in the marked cases.

Only two *Negative and Pseudo* reactions were seen. In these cases a slight papule 5 cm. in diameter appeared on the fourth day, in both arms exactly the same. The reaction lasted for three days and entirely disappeared simultaneously leaving no pigmentation or trace whatever.

No *Positive and Pseudo* reaction was seen in our series.

The group tested included the entire household of the pastor mentioned above whose daughter had diphtheria. P. S. the pastor, S. B. his wife, V. S. his son of five, and the youngest daughter just 15 days old were all *Negative*. The girl who had had diphtheria in February 1928 as mentioned above was *Positive*.

Statistics.

Schick tested children and infants, including a few adults.

Age group.	Number tested.	Number positive.	Pseudo-reactions.	Per cent. positive.
1–3 months	7	1	0	14
3—6 ,,	8	0	0	0
6—12 ,,	12	8	0	66·6
1–3 years ..	45	25	0	62
3–6 ,, ..	28	3	0	10·7
7–10 ,, ..	36	5	0	14
11—14 ,, ..	38	1 plus—minus, very slight reaction yet apparently *Positive*.	1 *Negative and Pseudo.*	2·6
15–20 ,, ..	12	0	0	0
Total children and infants.	186			
21–30 years.	4	0	1 *Negative and Pseudo.*	
31–40 ,,	1	0	0	
41 50 ,,	1	0	0	
51—60 ,,	1	0	0	
Total Indians.	193			
European adults.	4	3	0	
GRAND TOTAL	197			

As this is such a small number of cases, percentages are not to be considered to be accurate, but they are an indication as to the approximate findings that may be expected in a larger survey.

One of the striking things is the small percentage of the children of the groups from the age of four and up who are susceptible. This is the roaming age and it may be because of this fact that there are fewer cases and that when a case does appear it does not spread as it might possibly otherwise do if these older children were more susceptible.

Of the seven-to-ten-year children two in the boarding school, who were found positive, are said to be the most slovenly and ill kept of the entire boarding school.

For the apparently high immunity of the infants under 6 months, I have no explanation except that perhaps the average Indian mother may be endowed with a high anti-toxin creating power which she transfers to her infant through her milk. After six months the infant has an opportunity to get other food and after nine months *dal* and rice even are given by mothers, especially those who do not have enough milk for their offspring.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The statistics on the frequency of the Schick reaction among the populations of different countries furnish results essentially different. The marked increase during the period from the second year of life to the beginning of school, as brought out by the American statistics, is entirely lacking in the German statistics.

In the statistics presented for India there is a very marked decrease of susceptibility before the sixth month and after the third year. In making comparisons the fact is again evident that insufficient statistics are at hand to make comparison with the statistics taken from the multitude of cases recorded in Germany and in America. It is hoped that others may make and report observations of Schick tests until sufficient statistics are available. Unfortunately there were no statistics of other nations at hand in the station to present for further comparisons.

Age group.	American Statistics.	German Statistics.	Our Statistics.
1—3 months ..	15%	21·5%	14%
3—6 „ .	30%	44%	(Insufficient data) 0%
6—12 „ ..	56—91%	42%	66·6%
1—3 years ..	83%	43·4%	62%
4—6 „ ..	53%	45%	10·7%
7—10 „ ..	36%	41%	14%
11—14 „ ..	22%	29%	0%

It might be interesting to quote from the results among European and Anglo-Indian children obtained by Fox, McDonald, and McCombie Young in Shillong.

Showing the number of positive Schick reactions and pseudo-reactions according to age.

Age.	Number tested.	Number positive.	Percentage positive.	Number of pseudo-reactions.
1—5years	11	6	54·5	0
5—10 years	97	50	51·5	3
10—15 years	137	57	41·6	5
Over 20 years	6	4	66·6	2
TOTAL ..	271	125	46·1	12

Conclusion.

To-day, September 4th, the author has lost a case of diphtheria, an Indian child. ("The smears show a few diphtheria bacilli" is the report returned by Major G. Shanks, of the Department of Pathology and Bacteriology, Medical College, Calcutta, thus confirming the diagnosis). In spite of the fact that he has been concentrating on the Schick test and diphtheria for the last two months this case was enough to trip him and the anti-toxin was not given in time to stay off a cardiac paralysis. This goes to show that the results of such an investigation as above presented may not be untimely, warning us all again that there is a very large group of little children and infants around us that are susceptible to this serious and often terrible disease. It also indicates that in looking for diagnoses, the throat should be one of the places routinely examined and when in doubt anti-toxin should be given.

This report seems to indicate that in efforts for prophylaxis the children belong to the group from six months to four years should receive the prophylaxis treatment first. There is no question that this susceptible group should be Schick tested and those with positive reactions should have toxin, anti-toxin or the toxoid as a permanent protection. Before making any deductions about the older "school age" children more statistics are required, and the writer would urge all those in charge of schools to do the Schick test and give their results together with their experiences with diphtheria so that some intelligent conclusion may be drawn to guide us with this problem. There are many unknown factors in this matter that need further investigation. Why is not diphtheria more common? There is probably much more diphtheria around than we notice.

BIBLIOGRAPHY.

Fox, E. C. R., McDonald, E. J. C., and McCombie Young, T. C. (1923). The Schick Test and Immunization by Toxin—Anti-toxin in Assam. *Indian Med. Gaz.*, September, p. 419.

Rambo, V. C. (1928). Diphtheria an Ever-Present Danger in India: A Report on a Series of Cases in Bilaspur District. Central Provinces, India. *Indian Med. Gaz.*, October, p. 575.

Copeman, S. M., O'Brien, R. A., Eagleton, A. J. and Glenny, A. T. (1928). Experiences with the Schick test and Active Immunization Against Diphtheria. *Brit. Journ. Exp. Path.*, p. 342.

(Quoted from the Medical Research Council's Monograph on Diphtheria.)

Berlin letter to the *Journ. Amer. Med. Assoc.*, 18th Feb., 1928, Vol. 90.

A Mirror of Hospital Practice.

A CASE OF POST-KALA-AZAR DERMAL LEISHMANIASIS.

By NEPAL CHANDRA DEY,

Sub-Assistant Surgeon, on Kala-azar Duty, Assam.

A CASE of dermal leishmaniasis after a cure for kala-azar has been effected, is a rare condition; still rarer in Assam. In my experience extending over a period of four years as a Sub-Assistant Surgeon on kala-azar duty in the most heavily infected areas of Nowgong (Assam) district, which is admittedly a renowned epidemic area for kala-azar, and where treatment and survey are both constant and intensive, I have come across only this one case:—

C. R., aged 12 years, Hindu, male, from Nowgong (Assam).

Chief complaint:—

(1) Brownish discoloration of the skin in patches of 1 inch diameter over the entire

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

body except the trunk where there were a few very small depigmented spots.

(2) Discrete nodules on the lips, inner side of the elbow joints and on the anterior aspects of the knee joints.

A confluent diffuse type on the dorsal aspects of the wrist joints, extending from about 1 inch above the wrists to the tips of the fingers and also on the similar aspects of the ankle joints, extending from about 2 inches above the ankles to the tips of the toes.

Family History.—One brother died of kala-azar.

Previous Illness.—Suffered from kala-azar and was cured after a course of injections of sodium antimony tartrate.

Previous Treatment.—Received three injections of sodium hydnocarpate: case was diagnosed as leprosy.

Duration of the Disease.—About four years.

Nature of onset.—Four months after being discharged cured of kala-azar the patient noticed very small depigmented spots on the lips, chin, arms and forearms, thighs and legs and last of all on the trunk. These spots grew larger. Subsequently these patches were replaced by nodules on the lips, backs of the wrists, dorsum of the feet, anterior aspects of the knee joints and inner aspects of the elbow joints.

Spleen.—Not palpable.

Liver.—1 inch below the right costal arch.

Aldehyde test.—Negative.

Urea Stibamine test.—Positive in 5 and 10 dilutions of serum with 4 per cent. solution.

Total W. B. C. count.—8,600.

Different W. B. C. count.

Polymorphonuclears	..	62 per cent.
Small lymphocyte	..	18 ,, ,,
Large mononuclears	..	12 ,, ,,
Eosinophiles	..	8 ,, ,,

He had goitre before the attack of kala-azar.

Now I suspected the case to be one of dermal leishmanoid. I next prepared six slides from the cut surface of a nodule and after staining with Leishman's stain, I found Leishman-Donovan bodies on examination in large numbers in various forms. I was struck by the fact that the first slide which contained numerous blood cells was the one in which Leishman-Donovan bodies showed up best and were plentiful.

On examination the characteristics of the parasite were as follows:—

1. They were all extra-cellular.
2. The parasite was often seen in clusters of 8 and 9 lying between cellular tissues.
3. Many of them were almost at the point of complete division. (Two cells connected by a bridge of cytoplasm.)
4. Some were at the beginning of division (double nucleus and double kinetoplasts).
5. The nuclei were spongy in appearance in lightly stained specimens.

Treatment.—The boy was discharged clinically cured after receiving 2.4 grms. of urea stibamine (Brahmachari). All the nodules and depigmented spots disappeared and the general health of the patient improved very much.

My thanks are due to Dr. P. K. Das, Sub-Assistant Surgeon, Jajari K. A. Dispensary, for kindly communicating the result of treatment.

Note.—This case is of special interest in view of the apparent rarity of the disease in Assam. At the Calcutta School of Tropical Medicine we have notes on well over 100 cases collected during the last 3 years.—EDITOR, *I. M. G.*

A HEART CASE—FOR DIAGNOSIS.

By PROVAT CHANDRA BAGCHI, L.M.F.,
Madaripur Charitable Dispensary, Malsara P. O., Dist. Rajshahi, Bengal.

I SEND the following notes of a case for diagnosis, and I believe it will certainly provide some interest to readers of this paper.

The patient, a fair-skinned Hindu girl, age 11 years, not well-nourished. Height 4 ft. 3½ inches, chest 1 ft. 11½ inches. Forehead prominent, lips thick, nose flat, eyes prominent and congested. A peculiar ashy pigmentation of the skin over the alæ of the nose, lobules of the ear and external canthi of the eyes can be noticed. The face is cyanosed and the venules are distinct. The fingers and toes are abnormally long, clubbed and cyanosed. There is overgrowth of nails present.

Endocrine deficiency and the other causes of osteo-arthopathy being eliminated, her present condition could be referred to one due to heart disease—chronic or congenital.

Past History.—She has never been a subject of rheumatism—acute or chronic, nor of congenital syphilis. Her parents—as they say—are absolutely free from either of the diseases.

Present Complaints.—Dyspnœa and palpitation on slight exertion, sometimes paroxysmal. Aching pain of the bases of the ungual phalanges occurs in pyrexia from any cause.

CHEST.

Lungs.—Are resonant throughout except at their bases where there is moderate dullness and the vesicular murmur cannot be heard.

Heart.—The apex-beat is visible in the 5th interspace—left, 1 inch lateral to the mid-clavicular line. The cardiac dullness extends from the mid-sternal line to the apex = 4 inches. Auscultation reveals a systolic bruit all over the præcordium except the apical region. This bruit is of rough, grating character and is loudest over the pulmonary area. Pulmonary second sound is loud and distinct. At the apex and over a very small area a pre-systolic bruit can be distinctly heard—the systolic sound is neither replaced nor is the bruit present with it. The systolic bruit can be heard throughout the left

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

half of the chest in front and is conducted through the carotids and the subclavian arteries.

Pulse.—Regular, volume—small, tension—moderate.

Now the majority of the above clinical signs and symptoms refer to the presence of congenital pulmonary stenosis, but I should be glad if any reader of this paper can account for the presence of :—

(*i*) Pre-systolic murmur at the apical area.

(*ii*) Conduction of the murmur through the carotids and subclavian arteries.

(*iii*) Loud and distinct pulmonary second sound.

(*iv*) Aching pain at the bases of ungual phalanges occurring in pyrexia from any cause.

[*Note.*—Some of the signs and symptoms suggest patent *ductus arteriosus.*—EDITOR, *I. M. G.*]

A CASE OF BLEEDING FROM THE BREAST.

By D. N. SINHA, M.B.,
and
R. K. MUKHERJEE, S.A.S.,
Suri Sadar Hospital, Birbhum.

ON the 11th October, 1928, an old out-door patient Khudan Bibi, Mohammedan female, aged 50, came to the out-door with the following complaints :—

(1) She has been bleeding almost continually from the venous blebs on the surface of the left breast for the last one year.

(2) The left breast feels tense and slightly tender.

(3) There are venous blebs on the surface of the breast.

Past History.—She used to menstruate regularly but it stopped 12 years ago. During the last 4 years she has had bleeding from the left breast. For the first 3 years she bled regularly 4 days a month. For one year she has been bleeding continually.

Personal History.—She has only one child, still living. Her husband died 35 years ago. She denies gonorrhœa and syphilis. She has been fairly healthy throughout her life.

Local Examination.—The left breast looks enlarged, tense and a little tender. There are angiomatic venous blebs present. These disappear on pressure. There is no ulcerous area nearby. The breast is not hard to the touch and there are no enlarged glands present anywhere throughout the body.

The patient again came on the 28th of October with fever. Her blood was examined and malaria parasites (B. T.) were found. She was treated by quinine. Her fever was cured in a few days but to our surprise we learnt she has stopped bleeding from the breast.

In conclusion, we beg to thank our chief colleague, Dr. W. A. Browne, Civil Surgeon, for kindly allowing us to publish the case.

A CASE OF UNUSUALLY LARGE CYSTIC GOITRE.

By G. M. IRVINE,
CAPTAIN, I.M.S.,
Indian Military Hospital, Bakloh.

THE following case may prove of interest as an example of unusually large cystic goitre.

The patient was an elderly "pahari" whom I met casually when on a shooting expedition outside the cantonment. Being interested in the unusual appearances of the tumour, I persuaded him for a small consideration to come to be examined and photographed.

He was unable to give a very intelligible account of himself. He thought he was about 50 years old and stated that he had had a swelling in his neck from boyhood, since which time it had increased imperceptibly to its present dimensions.

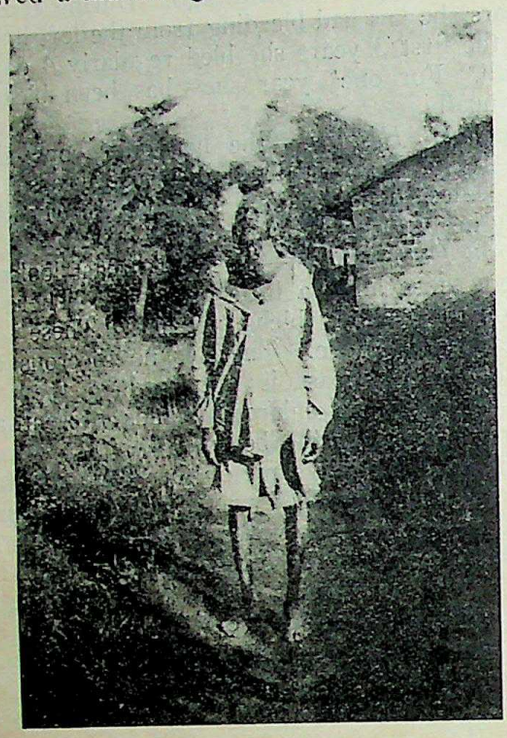
A large tense cystic tumour of regular outline, about the size and shape of a fœtal head projected forward from the left side of the neck. It was extremely vascular, the skin over it being covered by a network of tortuous and dilated veins, to a greater extent even than that suggested by the photograph. In the normal position of the head it extended from the lower border of the body of the mandible above to the level of the 2nd intercostal space below. A definite thrill was elicited.

The tumour was found to have its origin in the left lobe of the thyroid gland and followed the movement of the larynx in deglutition as far as its bulk would permit it. The larynx was displaced to the right but not

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

markedly so. The right lobe of the gland showed a marked general enlargement which



presented the usual features of a parenchymatous or colloid goitre without cyst formation.

Of symptoms referable to the tumour, the most important was stridor, due to a lateral pressure on the trachea. This was apparent at rest, and became more marked on exertion. The patient, however, complained of no embarrassment of his breathing and stated that it did not curtail his activities in any way. There was no history of that sudden obstruction during the night which is seen in large goitres, such as this, when the sufferer assumes during sleep a position which allows the weight of the tumour to fall on the trachea and compress it.

The tumour by its size interfered mechanically with the movements of the head. Any attempt to flex the head beyond the normal position of rest brought the mandible into contact with the tumour and restricted the movement; this did not appear, however, to inconvenience him greatly.

There were no general symptoms pointing to hyper- or dysthyroidism. The condition, pathologically, was presumably one of a cystadenoma arising in a gland which was in a condition of colloid parenchymatous goitre. The case was encountered in a region in the foot-hills of the Himalayas in the Northern Punjab where goitre is endemic, and where a large percentage of the indigenous population suffer from the condition in greater or lesser degree. Even in this locality where extreme enlargements of the thyroid are common a tumour of such dimensions was sufficiently remarkable.

CONGENITAL DEFICIENCY OF TWO FINGERS AND THEIR METACARPAL BONES.

By JAMAL-UD-DIN,
MAJOR, I.M.S.,
Civil Surgeon, Attock District, Campbellpur.

X, MALE, aged 35, actually came under observation in another connection.

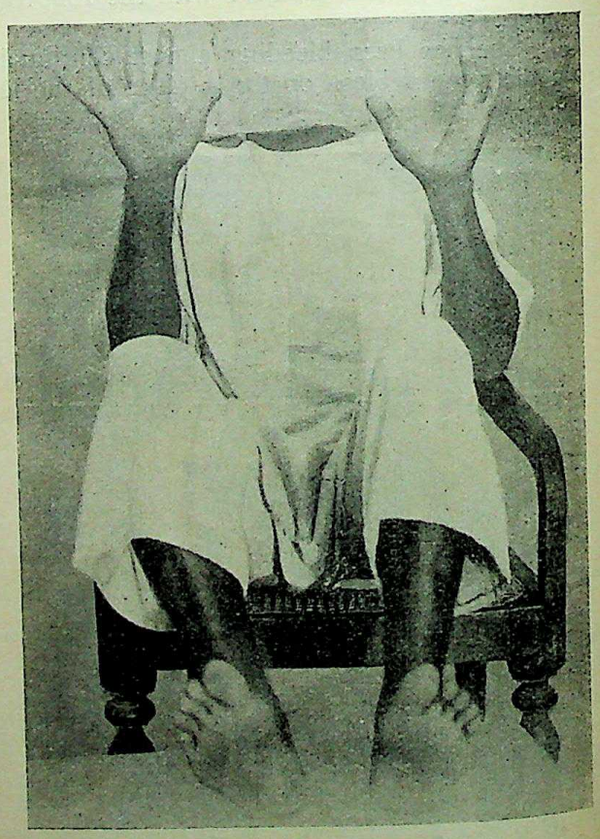
Both the feet and the right hand were all perfectly normal in all respects. The left hand, as is clearly shown in the accompanying photograph, was however incomplete in so far as both index and middle fingers as also their two metacarpals from the carpo-metacarpal junction downwards were all missing: so far as one could make out the carpus was normal in all respects. Unluckily the part could not be *x*-rayed, but only 11 bones of the hand could be counted.

The defect was congenital.

He was the only member of the family who was born with this defect and all the other members were in all respects normal.

No actual discomfort was noticed by him and the defect was no handicap in his work.

Both thenar and hypothenar eminences were unduly marked and the latter only to a degree faded towards the roots of the remaining fingers.



The defect, like others about this region, would appear to arise from intrauterine amputation by amniotic bands and can hardly be considered to be due to arrested development in utero—a possibility however which cannot be excluded.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail).

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones. The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

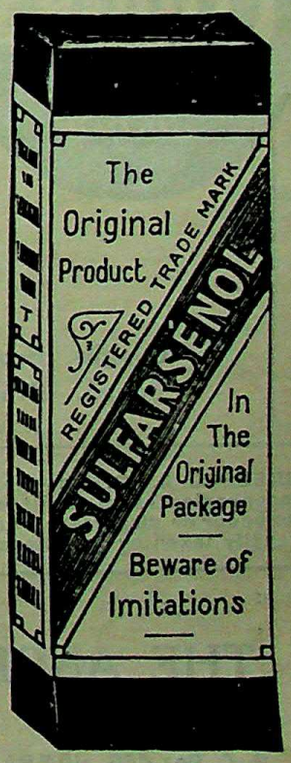
Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.



Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

OPOCRIN HEPAR.

Special liver extract for Pernicious Anæmia, Antitoxic effects, to favour intracellular absorption of Glucose, and for diabetes when due to defective functioning of the liver.

Price, bottle of 50 pills Rs. 3.

ONE GRAMME CREOSAL CONTAINS

Gualacol . .	48	centigrammes
Calcium . .	15	—
Phosphoric Acid	37	—

For COUGHS whatever their origin

50 Centigrammes **CREOSAL** per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

CREOSAL A.F.D. has none of the inconveniences of Gualacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY. P. O. Box 226, MADRAS.

Telegrams: "AMPSALVAS."

P. O. Box 7861, CALCUTTA. P. O. Box 134, RANGOON.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

MARCH.

THE ILLNESS OF H. M. THE KING-EMPEROR.

Now that H. M. the King-Emperor has been safely transferred to a quiet, and, we hope, uninterrupted convalescence at Bognor, in common with every journal in the British Empire we may breathe a prayer of the most profound thankfulness for so happy an issue. Only those who lived through the weeks of December, 1928 in London can realise the state of terrible anxiety which prevailed in the capital city. There was no other topic of conversation, and night after night the anxious crowds gathered at Buckingham Palace to see the 9-30 p.m. bulletin, rich and poor alike, women wrapped in furs who stepped out of their luxurious cars, women in rags, crowds from the closing theatres or those on their way home from a dance.

At the Armistice Day ceremony on November 11th, His Majesty looked frail and careworn, though as kingly as ever. The morning was one with a slight drizzle, and it is possible that exposure to the weather that morning may have contributed to the illness. The first bulletin—issued on the evening of the 21st November—announced that His Majesty was suffering from what is popularly termed "a feverish cold." By the 21st of November, there was definite congestion at the base of the right lung, with pleural friction. There was a serious increase of the pleurisy by the 24th of November, and finally two-thirds of the right lung was involved. By the same date the diagnosis had been confirmed by bacteriological tests and *x*-ray examination.

An illness of such severity in a patient aged 63 was naturally one in which only a very guarded prognosis could be given. We owe His Majesty's fortunate recovery to three chief factors, the highly skilled medical attendance provided, the magnificent nursing, and His Majesty's own determination to live. To these we must add the devoted service of Her Majesty the Queen.

By the third week of illness the clinical picture was complete, that of an extensive pleurisy in the right lung, with a streptococcal infection of the blood stream. The pleurisy had extended to the diaphragm, causing severe pain, and attacks of bronchial spasm. The whole issue now turned upon the heart muscle, and every possible measure was taken to ensure the utmost rest and sleep. By the 5th of December, the local signs in the lung appeared to be improving, but the general toxæmia was profound. A period of temporary improvement of the local condition, however, was followed by an increase in the fever and the leucocytosis, and the development of an empyema was suspected. Pus was finally found, and drainage effected by rib resection, the operation being carried out by Sir Hugh Rigby, and the general anæsthetic given by Dr. Francis Shipway. The next forty-eight hours were naturally ones of acute anxiety, but there was no increase in the weakness.

There next set in a prolonged period of ebb and flow of the illness. The bulletins were most carefully guarded in tone, but the general public, reading between the lines, knew how critical was the situation. An authoritative bulletin was issued to the medical press on the 19th of December, and as it gives a very complete account of His Majesty's illness in general, we take the liberty of quoting it from p. 1151 of the *British Medical Journal* for the 22nd of December. The bulletin was as follows:—

"There are signs that the King's illness is producing in the public mind a sensitiveness, only too natural, caused by weeks of anxiety, and producing too easily alarm and therefore distress, both of which it is most desirable to avoid. Doctors, in their various spheres, can do much, by their knowledge, to maintain hope and confidence.

"The present condition of His Majesty can be best understood by recalling earlier stages of this severe illness. In the first phase, gradual in its onset, there were to be noted general infection with imperfect localization—little or no cough and only one small patch of pleuritic friction; blood culture positive (streptococcus); an irritative state of the nervous system which produced profound distress and sense of illness. Yet with these was a wish, born of quiet courage and the habit of duty, to make light of the illness and hold on to work, thus adding to the wear and tear of the fever. Towards the end of this first phase came an accentuation of pleuritic friction which extended to the diaphragm. The second phase was one of increasing toxæmia, with dusky appearance, dry cracked tongue, periods of delirium, exhaustion—in short, a clinical picture resembling that of a case of severe typhoid fever in the third and fourth weeks, but with the added anxiety of attacks of dyspnœa and cyanosis, due to strain on the heart. With the next phase came an abatement of fever and some evidence of localization. The blood culture was now negative, toxæmia was less, delirium subsiding. The localization in the right lung did not result at this stage in effusion, as shown by puncture and excellent radiographs. A few days later the temperature rose rather abruptly to a higher level, and on 12th December, there was evidence at the extreme right base of an effusion which had commenced between the lung and the diaphragm. Drainage by means of rib resection was performed on the same day under general anæsthesia (gas-oxygen-ether). The predominant organism in the empyema has now been established to be identical with the streptococcus found in the blood.

"Though the infective process has become gradually localized, its severity, coupled with the lowered vitality resulting from the length of the illness, must make the progress of healing difficult and tedious. Local sloughing, however, is less pronounced to-day, and tissue reaction apparent. To stimulate vitality of tissues a brief general exposure to ultra-violet rays from a mercury lamp has been made each day since 15th December. The effect of these exposures is being checked by leucocyte counts and estimation of the bactericidal power of the patient's blood. There is reason to think that this employment of the ultra-violet rays has, in combination with the treatment mentioned in previous statements, been beneficial.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"It is hoped that the foregoing account will help towards an understanding of the future course of the illness. It will be apparent to medical men that not only the severity and length of the infection, but the exhaustion resulting therefrom, must make progress slow and difficult. At the same time, dangerous phases of the illness have been surmounted, and there are increasingly solid grounds for hoping that recovery will result from this long and anxious struggle."

The week following Christmas, however, saw a slight, but marked improvement, and the bulletins were shorter and were issued at longer intervals. A supplementary report was issued to the medical profession on the 2nd of January, and read as follows: (*British Medical Journal*, 5th January, 1929, p. 31).

"For true understanding of the position it must be emphasized that neither in its inception nor in its subsequent course has this illness conformed to what is called 'pleuro-pneumonia'; rather was it a streptococcal septicæmia which by fortunate happening localized at the base of the right lung, first imperfectly and later as an empyema ('fixation abscess') forming between the base of the lung and the diaphragm. In the second phase of the illness (*vide* report 22nd December) the clinical picture—dusky appearance, dry cracked tongue, delirium, subsultus, exhaustion—was that of a severe toxæmia, and resembled that of a case of severe typhoid fever in the third or fourth week. So now the picture is that of the aftermath of a severe general infection. The empyema wound is now clean and steadily diminishing in size, the discharge from the pleural cavity is small in amount, and the streptococcus grown from the pus (identical with that originally found in the blood) is diminishing in potency. Eusol has been an effective local application, and though—through the courtesy of an American colleague, Dr. Sherman of Pittsburg—a supply of Dakin's solution, electrolytically prepared, has been recently received, there has been no opportunity to use it because the necessity for any such local application has passed.

"On the other hand, the disinclination for food and the dryness of the tongue, the low blood pressure, the weakness and wasting, the notable exhaustion, though slowly improving, will for long be an anxious problem. It will be readily understood that while this exhaustion state is pronounced, the margin of reserve power must be narrow, and that small set-backs, inevitable at this stage, have a correspondingly more severe effect. It is important that the public should not interpret such set-backs or reports of 'no change' as relapses. During each week there will be ups and downs, and progress will consist of a slow and increasing predominance of the ups over the downs. One of the inevitable difficulties in so long an illness is to convey to the public a true picture—neither too bright nor too dark. It is for this reason amongst others that the courtesy of the medical press is valuable, in order to convey through their readers to the public fuller information, and so avoid the risk of misunderstanding.

"As regards nourishment, about which so many suggestions have been received, the difficulties will be understood when it is stated that there is disinclination for most foods and dislike for many, and that weakness necessitates that nourishment be given by a nurse with a feeder. Adequacy of nutriment, both as regards quantity and variety, is now being secured, though not without difficulty. Moreover, the combating of loss of weight, which has been notable, depends not only on food taken but food digested and assimilated, and here again the exhaustion tells its tale. The blood-pressure has fallen too low and the calcium content of the blood has of late considerably decreased. The administration of calcium, parathyroid extract, and strychnine is apparently beneficial. The same is true of ray therapy, which is being continued. It need hardly be stated that the question of blood transfusion has received full consideration. In an illness of this complicated character the indications for transfusion must be clear, and it must be remembered that with the most skilled procedure its employment would in this case entail risk. The striking results following transfusion—for example, in cases of anæmia due to either hæmorrhage or infection—are apt to lead to its employment in other conditions without adequate consideration of the pros and cons. It is sufficient to repeat that in this grave illness it has been fully considered, and put aside at the present stage as definitely undesirable. Moreover, the red blood cell count is one of the most hopeful features, for whereas in the early days of the illness the red count was as low as 2,900,000, to-day it reaches 4,300,000.

"The exhaustion is as much a weariness of mind as of body. Though there is an increasing sense of the burden of his illness, the will of the King to live is there. Because of this exhaustion the course must be long and for the present anxious. None the less, improvement and progress are taking place slowly but surely enough to justify the hope that the King will be restored to his people."

The subsequent course of His Majesty's illness was a very slow and gradual improvement, although anxiety still continued. By the middle of January the bulletins recorded quiet days and a more hopeful outlook than at any time during the previous seven weeks. Finally it proved possible to move the patient by ambulance to Bognor on 9th February, where at Craigwell House he will enjoy whatever sunshine the South Coast affords, and the refreshment of a complete change of scenery and environment. The bulletin of 13th February recorded that "His Majesty's progress is such that he is now able to read occasionally. He is on ordinary diet and takes plenty of nourishment." The only danger that still appears to exist in connection with the case is the terrible weather at present prevailing in the British Isles, though one may be certain that every possible precaution will be taken.

The medical profession may take a legitimate pride in the marvellous recovery made by the King-Emperor. We do not believe that ten years ago medical science could have brought about such a recovery.

SPECIAL ARTICLE.

THE PRESENT POSITION OF MEDICAL SCIENCE IN INDIA.*

By C. A. GILL, D.P.H.,
LIEUTENANT-COLONEL, I.M.S.,
Director of Public Health, Punjab.

WHEN I was asked to deliver this lecture I gladly consented to do so, but not being actively engaged in general practice, I felt under some difficulty in regard to the selection of a suitable subject. I thought, however, that it might perhaps be permissible, as a change from the usual

*A lecture delivered before the Punjab Branch of the British Medical Association on 23rd January, 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

clinical lecture, to consider the present position of medical science in India.

It may seem, at first sight, that this subject is not one which lends itself to fruitful discussion by the members of the British Medical Association. We, at any rate, are confident of the strength and soundness of our position, and, in view of the number of Medical Colleges and Schools established in India, of the rapid multiplication of hospitals and dispensaries, and of their increasing popularity, it would seem that medical science is strongly entrenched in India. But not everyone shares these optimistic views. They point to the fact that there are powerful reactionary forces at work, that quackery flourishes like a green bay tree in Lebanon, that the medical profession is overcrowded, and that many private medical practitioners eke out a precarious livelihood. It may, therefore, be worth while to take stock of the situation, to trace the history of medical science in India, and, having then clarified our ideas in regard to the past, to consider briefly the present and the future.

I make no apology for making a digression into the past; we stand to-day the heirs of the past, and what we do to-day may make or mar the morrow; neither the present nor the future can, therefore, be understood except in relation to the past. We are moreover all so pre-occupied with the daily round and common task that few of us have the time or the opportunity of studying the history of our science. Indeed, I doubt if any other body of scientific men are so little acquainted with the history of their own science as the medical profession, and I cannot help thinking that this circumstance is responsible for many misconceptions and misunderstandings.

The early history of medical science, as of the human race itself, is fragmentary and incomplete, and it may be that existing views on the subject will have to be extensively revised in the light of future historical research; but, if it is permissible to base conjectures upon the little that is known, it would appear that as soon as man became endowed with the power of reflection, he began, by the familiar method of trial and error, to devise simple methods of alleviating the ills the flesh is heir to, and to formulate theories in regard to their causation. Shrewd observations and practical deductions were thus made at an extremely early period in the history of the human race, and, as might be expected, they were first mainly concerned with curative measures. Many examples might be quoted, but two must suffice: it is to the primitive inhabitants of Peru that we owe the discovery of the value of the bark of the cinchona tree in the treatment of malaria. Then again, the value of inoculation as a protection against smallpox was first discovered in India where it has been practised since an extremely remote period.

It may be assumed that speculations and observations were made to some extent in all quarters of the inhabited globe, but it is permissible to infer that they attained a relatively high degree of perfection amongst the more culturally advanced races. We would therefore expect that the ancient civilizations in the south of Europe, Asia Minor, Mesopotamia, India and China would have played a prominent part in the early history of medicine. It was indeed commonly held until quite recent times that the south-east corner of Europe, and more particularly Greece, constituted the birth-place of modern scientific medicine, but the tendency of modern historical research is to assign a rôle of increasing importance to the part played by Asia and more particularly by Mesopotamia, India and China.

So far as India is concerned, the oldest extant literature is to be found in the Vedas, which are believed to have been compiled about 4,000 years ago or more than 1,000 years before the birth of Hippocrates, "the father of medical science." The Vedas, however, contain little of scientific value, but the fourth book (The Atharvaveda), which deals mainly with magic and spells, contains some rudimentary anatomical and physiological observations. The writings of Sushruta, who lived at Benares, in the sixth century B.C. are, however, on a different plane, and compare not unfavourably with the Hippocratic "collection" of a slightly later date. In the case of both it may be said that they show evidence of centuries of scientific thought and research in medical matters. We can thus trace the small beginnings from which modern medical science has sprung to a common source in Europe and in Asia. Its subsequent history in the two areas, although still obscure, presents several features of great interest. In India, in addition to the followers of the physicians Sushruta and Charaka, the surgeon of Kashmir, and others, there arose another school of thought, who attributed medical knowledge to divine inspiration and revelation and, as a consequence of the fact that this latter school came to exercise a predominant position, medical science early came under priestly control and its scientific aspect dwindled and decayed. It is so much easier to make claims of divine power, and, in a primitive state of society, to establish them, than it is to undertake laborious investigations. But whatever the cause, in the East sacerdotalism soon obtained complete mastery and the dissection of human or other bodies was forbidden on the grounds of ceremonial uncleanness. Any advance on the crude anatomy and physiology of the Vedas thus became impossible and medical science became lost in a maze of speculations and theories whose accuracy could never be tested. The Vedas were in fact regarded as sacrosanct and any attempt to advance medical knowledge was considered as not only useless but even profane. In such an atmosphere medical science had little chance. The scientific spirit gradually died out and the Ayurvedic system—a system as truly scientific as that developed in Greece—failed to make good the promise of its early years.

The early history of medicine in Greece exhibits almost precisely similar features. Alongside

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the scientific system based upon the teachings of Hippocrates, there arose another system —the temple system—associated with the deity Asklepios, better known under his Latin name of Æsculapius, at whose shrines, priests, working on the simple faith of the superstitious, practised the basest form of medical jugglery. The followers of Æsculapius and of the Hippocratic school long continued side by side in perhaps too friendly rivalry, but the Greek medical philosophers of the classical period had no worthy successors, and the Æsculapian school eventually gained the upper hand. The active prosecution of anatomical and physiological enquiry gradually fell into desuetude, and, after the death of Galen (A.D. 200), it ceased absolutely. The great classical writings were lost or incarcerated in monasteries. The followers of Æsculapius then everywhere became triumphant, superstitious practices crept in and medicine fell into the hands of priests and charlatans. The priesthood obtained complete control and any attempt to question their authority was followed by penalties affecting this life and the next. Speaking of this period Professor Singer states "Medicine deteriorated into a collection of formulæ, punctuated by incantations, medicine remained surrounded by sacred associations, but the scientific stream, which was its life-blood, was dried up at its source."

The early history of medical science in the East and the West was thus not dissimilar. In both, alongside the scientific spirit which shows itself as a desire, by observation and experiment, by induction and by deduction, to probe into the secrets of nature and to build thereon a rational system of medicine, the followers of another debased system were always prominent and eventually triumphant. The debased system, which in its most primitive form is probably a derivative of nature-worship or Animism, comprises an unreasoned and unreasonable belief in the power of magic and spells. If there is any significant difference between the early history of medicine in the east and in the west, it is that in India demonology was almost from the first given a prominent place, so that the stream of pure science flowing from the spring of Sushruta was early submerged under a debased form of medicine in which astrology and demonic belief played a large part.

To what precise extent the Ayurvedic system was influenced by Greek thought and *vice versa* is not certain, but there is some reason to believe that each borrowed from the other and that the Arabic system, which arose somewhat later, borrowed largely from both. It is, however, probable that the scientific spirit reached a higher state of development in Greece than elsewhere, and we are on sure ground in stating that modern scientific medicine is mainly attributable to the inspiration derived from the writings of the classical medical philosophers of ancient Greece.

The point I wish to make here, and it is one of considerable importance, is that no single country can claim to constitute the birth-place of medical science and that no real distinction and no real rivalry can properly be said to exist, in so far as their early history is concerned, between the so-called eastern or Ayurvedic system and western medicine derived from Grecian sources. In short, the science of medicine is one and indivisible; there are many systems of treatment, but let me emphasise once more there is only one system of medical science and the East and the West each took a share in bringing about its birth.

The dark ages descended in Europe after the death of Galen (A.D. 200) and continued for about 1,200 years. The depraved condition of medical science in England in the 15th Century is well illustrated in the following quotation from the Paston letters (1464), in which Margaret Paston, writing to her husband says:

> "Also for Goddys sake be war what medesyns ye take of any fysissyans in London; I schal never trust to hem be cause of your fadr and myn onkyl, whose sowlys God asooyle."

There was thus a dark age for science both in the East and in the West, although, as we have shown, it commenced somewhat earlier and was more complete in the East. Here again, we cannot help being struck by the apparent similarity of the happenings in Europe and Asia. Why did the dark ages supervene? Was it an unconscious revolt against an exacting discipline, a mental lassitude, which induced man to bow to authority, rather than to think for himself, or was it disturbances in law and order which brought to the fore the brooding spirit of pagan man? We do not know, but it is difficult to imagine a more fascinating subject or one whose elucidation would more fully repay study.

The next stage in this brief history was the revival of learning and of science which commenced in Europe in the 13th century, but which did not become fully developed until two centuries later. Time does not permit of any account of this great movement which starting in Italy spread through western Europe and eventually in the 18th and 19th centuries to the whole world, and it must suffice to state that during the past four centuries, the progress of medical science, to which all civilized countries have contributed, has been immense and uninterrupted. We can only mention the names of a few of the great medical pioneers, of Leonardo da Vinci of Italy (1452 to 1518), Vessalius of Brussels (1514-1564), Ambroise Paré (1517-1590), the Frenchman, Francostoro (1485-1553), de Baillou (Ballonius) and of Thomas Sydenham (1620-1689) commonly termed "the English Hippocrates."

There was, however, no counterpart in India or in the east of the revival of learning in Europe, and the re-birth of medical science in India may be said to have occurred almost within living memory. There was thus no preceding

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

latent period during which the spirit of scientific inquiry, at the hands of those I have mentioned and many others, manifested itself despite all the terrors of the law and of the priesthood.

This account of the history of science, though brief and incomplete, does perhaps suffice to enable us to visualise in proper perspective the present position of medical science in India. The dark ages in the East, as we have seen, continued down to almost modern times. Throughout this long period the scientific spirit, so far as medicine is concerned, was dead, and the practice of medicine was, and still largely is, in the hands of Vaids and Hakims, who, we now see, may be regarded as the lineal descendants of a higher type of practitioner. They are in fact our medical brethren, who, cut off for centuries from observation and experiment, with no knowledge of anatomy and physiology—the sole avenue of approach to scientific medicine—whose botany is a drug list and whose remedies are worthless charms and incantations, have degenerated beyond all recognition. Alongside these men, thanks to the *alumni* of the medical colleges and schools established in India by the British Government, we now have a growing number of medical practitioners trained in the system of which Hippocrates and Sushruta were the founders. But these colleges and schools were originally established to serve the practical purpose of tending the sick, and at first, more especially, to provide for the needs of the civil and military servants of Government. But the practice of a system of medicine does not necessarily mean the acquirement of the scientific spirit upon which it is based. Drugs may come into fashion and disappear, methods of treatment may change, technique may improve, but something more than a knowledge of these things is required if medical science is not once more to degenerate into dead formalism and quackery. The curse of medicine, as of all sciences has always been "the practical man" or the man who considers the immediate end of his art without regard to the knowledge on which it is based. My reading of the situation is that we have at the present time many practitioners but few students of scientific medicine and that, whilst there are some grounds for adopting an optimistic attitude, the future of medical science in India and, in consequence, the well-being of the inhabitants of this great land, is not yet assured. Many of our practitioners have in fact so recently assumed the mantle of Hippocrates and Sushruta, and their contact with the scientific spirit in medical colleges is so brief, that there is a distinct danger of a lapse into quackery. In short, history may repeat itself and what happened at the beginning of the Christian era may occur again in the 20th century. It is for you, by precept and example, to falsify this pessimistic forecast.

Something must be said in regard to the Vaids and Hakims, those interesting relics, from the historical point of view, of a by-gone age; it is clearly impossible, even if it were practicable, out of regard for the solace, if not the skill, they bring to perhaps 90 per cent. of the people of this land, to abolish them at once; they obviously must continue until such time as they can be replaced by more worthy and more efficient substitutes. It would of course be folly to bolster up any type of practitioner whose training is unscientific, and every available rupee should be devoted to the provision of medical relief by medical practitioners trained in the methods of the one and indivisible medical science. Let us not waste our time and our energies in discussing the merits or demerits of Vaids and Hakims. There are, indeed, more quacks inside the medical profession than outside—and the former are much the more dangerous!—but if the Vaids and Hakims can safely be left to themselves, it is clear that the practitioners of scientific medicine cannot afford to be satisfied with the smattering of medical knowledge they learn as students; they must, in every way open to them, by reading, by contact with those possessing the scientific spirit, by joining scientific societies such as this, and by their every-day professional conduct and practices show their superiority, and thus justify themselves in the eyes of the public. They must, in short, cultivate the scientific spirit and remain students of medicine all their lives. If medical science in India is to advance and not to undergo retrogression—and to my mind the decision is at the moment trembling in the balance—it is essential that close contact should be maintained with all that is best in medical science and that, irrespective of all other considerations, the palm must go to those that deserve it. We must, however, above all, learn to depend on ourselves and I cannot better conclude this lecture than by quoting to you the wise aphorism of Sushruta, so reminiscent of Hippocrates.

"There is no end to the science of medicine. Hence needfully and carefully devote thyself to it, considering it an honour to practise the art."

Current Topics.

Observations on Chronic Splenomegaly in Childhood: Diagnosis and Treatment.

By ROBERT HUTCHISON, M.D., F.R.C.P.

(*Brit. Med. Journ.*, August 18, 1928, p. 281.)

BEFORE proceeding to the differential diagnosis of the various splenomegalies of childhood, it is advisable to make sure that the abdominal tumour in question really is an enlarged spleen. Usually this is easy enough, but sometimes one is in doubt, especially as to the possibility that the tumour may be an enlarged left kidney or suprarenal. Sometimes the ordinary diagnostic criteria —that a large spleen does not extend back into the loin, that it has a sharp edge with a notch, that it crosses the middle line below the umbilicus, that the fingers cannot be passed between the tumour and the ribs, that the descending colon does not lie in front of it—all fail, and in that case it is important to remember that dullness extending above the level of the ninth rib in the mid-axillary line is in favour of the tumour being

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

splenic. An *x*-ray examination, with pyelography if necessary, may help in the differentiation. I would only repeat that the difficulty of telling a splenic from a renal tumour is sometimes a real one, and that the methods of distinguishing them are worth discussion.

Having settled that the tumour is an enlarged spleen, it is necessary, before proceeding farther, to have some sort of classification of the different varieties of splenomegaly met with in childhood. The only satisfactory classification would be an etiological one, but of that our present knowledge does not allow, and I therefore propose, for purposes of discussion, to consider the subject under certain broad groups.

1. *Tumours (Cysts, New Growths, Abscesses, etc.).*

These are very rare, and for practical purposes undiagnosable. If diagnosed, the proper treatment, of course, would be surgical.

2. *Chronic Infections.*

Of these we have to consider tuberculosis, syphilis, lymphadenoma, and chronic sepsis.

In chronic tuberculosis splenomegaly is not likely to be the "presenting" sign, although in the acuter forms of tuberculosis in young infants enlargement of the spleen is very common. Cases are described, however, though I do not remember to have seen one myself, in which massive caseating tuberculosis leads to considerable splenomegaly. The spleen in such cases may be tender, and polycythæmia and some degree of cyanosis are said sometimes to be present. There will often, of course, be less conspicuous tuberculous lesions elsewhere. The proper treatment is splenectomy.

The relation of *congenital syphilis* to splenomegaly in childhood is very important, but I would suggest, for purposes of discussion, that its frequency as a factor in causing the condition tends to be exaggerated. After all, inherited syphilis is a comparatively rare disease, and so we may say that, although syphilis certainly very often leads to splenomegaly, yet not many cases of splenomegaly are due to syphilis. It is in infancy that a syphilitic enlargement of the spleen is most likely to be met with, but there is reason to believe that in later childhood—say, between the ages of 5 and 7—splenomegaly may be the only sign of a syphilitic taint, and it appears again about the age of puberty in association with syphilitic cirrhosis of the liver. In the pre-Wassermann days the tendency was to ascribe every splenomegaly of doubtful origin to syphilis, but since the introduction of that test I have been impressed by the frequency with which it is found to be negative in these circumstances. I am aware that in some undoubtedly syphilitic cases—in syphilitic cirrhosis, for instance—the Wassermann reaction may be negative, and we might well discuss what degree of confidence we can place in it as a criterion of the presence or absence of a syphilitic taint. I would only point out that it is, after all, the only positive test we have in a case in which unmistakable objective signs of the disease are wanting, and if we are not to be able to trust it the whole question of the relation of syphilis to splenomegalies of obscure origin in childhood goes back into the melting-pot. It is all the more important that we should have some trustworthy test for the presence of syphilis, inasmuch as it has been suggested by Dr. Parkes Weber and others that an inherited taint may form a basis on which enlargement of the spleen—though not primarily due to syphilis—may develop more easily, or in a more exaggerated degree, than it does in a child whose heredity is not thus burdened. Although this view seems to me rather speculative, it would be of interest to have opinions upon it.

Where syphilis is believed to be the cause of a splenomegaly, vigorous antisyphilitic treatment must, of course, be adopted. In some cases, however, the changes in the spleen may have proceeded so far that they are unaffected by any form of drug treatment, and in that case splenectomy may be justifiable.

Lymphadenoma as a cause of enlargement of the spleen, without there being evidence of the disease in the glands, must be very rare. For my own part, I have never met with an instance of it, though cases have been described by others, and I do not see how it can be diagnosed with certainty. If diagnosed, the appropriate treatment would be the application of *x*-rays to the tumour.

Chronic sepsis has been put forward as a cause of splenomegaly, as of most other things. Dr. Gordon Ward, for instance, regards it as of considerable importance, though I think on rather insufficient grounds. That splenomegaly may be the presenting sign in cases of very chronic infective endocarditis (endocarditis lenta) is certain, but I doubt if cases of this very chronic type are ever met with in childhood; and of "intestinal sepsis" as a cause of enlarged spleen we know nothing.

3. *Tropical Splenomegalies.*

Chronic protozoal infections, as in malaria and kala-azar, may cause great enlargement of the spleen in children, but as the diagnosis and treatment of these diseases is the same as in adults we need not discuss them.

4. *Splenomegaly in Metabolic Diseases.*

We have here chiefly to discuss the part played by rickets. This has been almost as much disputed as the rôle of syphilis in producing splenomegaly, and, I believe, fully as much exaggerated. That severe rickets tends to be accompanied by some degree of enlargement of the spleen is undeniable, though in some cases the organ is not so much enlarged as pushed down by deformity of the ribs; but I would suggest, for purposes of discussion, that rickets alone is not an important factor in the production of splenomegaly, especially nowadays. The same may be said, with even greater truth, of waxy disease, which we need rarely think of when the nature of an enlarged spleen is under discussion.

5. *Gaucher's Disease.*

Gaucher's disease should, I suppose, now be included under the metabolic disorders associated with splenomegaly. It is rare, though probably not so rare as is believed, and is to be diagnosed by its familial, though not hereditary, incidence, and, above all, by the demonstration of the characteristic endothelioid cells in the product of a splenic puncture. Opinions as to the value of splenectomy in the Gaucher cases are divergent. The operation cannot certainly be regarded as a cure, seeing that the disease is one which is not confined to the spleen, but affects the whole recticulo-endothelial system throughout the body. If the splenic tumour is causing local discomfort, however, its removal would appear to be justified.

6. *Splenomegaly in Diseases of the Blood.*

We have here to consider the leukæmias, splenic anæmia of infancy (anæmia pseudo-leukæmica infantum of von Jaksch), acholuric jaundice, purpura, and erythræmia.

The *leukæmias* we may dismiss in a word. In childhood they are almost always acute, and therefore not a cause of chronic splenomegaly. I have only once seen a case of chronic myeloid leukæmia in a child—a boy of 12—and for practical purposes leukæmia as the cause of a chronically enlarged spleen in childhood need not be considered. If suspected, a blood count would at once establish the diagnosis.

The *splenic anæmia of infancy* is in an altogether different category. It used to be relatively common, and when I was giving the Goulstonian Lectures twenty-five years ago I had no difficulty in collecting notes of a large number of cases, all of which had been under my own observation. In recent years, however, it has become rare, and I have not seen a typical case now for a long time. I do not propose to discuss the nature of this disease, and whether it is merely the result of a hæmopoietic reaction to various debilitating influences in childhood, or whether it is—as I at least hold—a disease *sui generis*. For our present purpose it is sufficient to point out that it should not be diagnosed after the age of 3, although it is true that the enlarged spleen may persist beyond that age, when the anæmia has passed off, before gradually disappearing. In that case, however,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

there should be a clear history of the disease in the earlier years. The blood picture in the acute phase is characteristic.

In considering the treatment of this form it is to be remembered that the disease tends to spontaneous recovery in the great majority of cases, given suitable hygienic measures. I do not myself consider that splenectomy is ever called for in it, as the operation must be highly dangerous in the severe forms and is unnecessary in the milder. Some successful cases have, however, been reported but I think it probable that these would have recovered without operation. Whether *x*-ray treatment is of any use I am not sure. In the few cases in which I have tried it the results have been disappointing, but others have been more fortunate. At least, it cannot do any harm.

I need not say much about the splenomegaly of *acholuric jaundice;* it is now well recognized as a not uncommon occurrence, and the diagnosis can be established with certainty from the characteristic increased fragility of the red cells. There is also no doubt that splenectomy is the only effective form of treatment.

In *purpura*—even in the chronic forms—splenomegaly is not likely to be the presenting sign, and I only mention it here because in that variety of the disease in which the platelets are greatly diminished removal of the spleen is now generally agreed to be very beneficial.

I doubt whether true erythræmia (Osler-Vaquez disease) is ever a cause of chronic splenomegaly in childhood, but it is interesting to note that polycythæmia is sometimes a feature in cases of syphilitic splenomegaly.

7. *Splenomegaly Associated with Cirrhosis of the Liver.*

We now come to that interesting group of cases in which an enlarged spleen is associated with cirrhosis of the liver. Three forms of cirrhosis with splenomegaly—excluding for the moment Banti's disease—may be distinguished.

(*a*) *Idiopathic Non-alcoholic Progressive Cirrhosis* (Parkes Weber).—This is a cirrhosis of unknown cause, which resembles the ordinary portal cirrhosis of adults, runs a fairly rapid course, and often terminates in hæmatemesis. The spleen is always enlarged to some degree, but in certain of the cases is so conspicuous and early a feature as to be the "presenting" sign, and these have been spoken of as cases of "splenomegalic cirrhosis," or cirrhosis with "splenic predominance." Their diagnosis from Banti's disease is not easy, and will be considered later, and whether or not they are suitable cases for splenectomy demands discussion. Some writers—Thursfield for example—maintain that the operation in these cases is almost invariably fatal, but I am not at all sure that this is true. In the following case, for instance, if, as I believe, it must be included in this group, splenectomy appeared to effect a cure.

The patient was a boy aged 12, who was admitted for bleeding from the gums with a history of always having bruised easily. His spleen was enlarged down to the umbilicus, and the liver was easily palpable. The red cells numbered 4½ million, with 70 per cent. of hæmoglobin, and the white cells 1,600. The Wassermann reaction was negative, both in the patient and in his mother. Four months later he was re-admitted with ascites. The spleen was removed, and at the operation the liver was found to be cirrhotic. Twelve years later he was in excellent health.

The question of splenectomy in these cases is, I repeat, one for discussion.

(*b*) *Syphilitic Cirrhosis with Splenomegaly.*—These cases are met with in later childhood about the time when interstitial keratitis and the other signs of "late syphilis" manifest themselves, and I have already said that there is reason to believe that they do not always give a positive Wassermann reaction, and that, if anti-syphilitic treatment fails, removal of the spleen may be justified.

(*c*) *Splenomegaly with Biliary Cirrhosis.*—These are the cases described by Gilbert and Fournier, and are believed to be the form which Hanot's cirrhosis takes in the child. They are said to be characterized by the presence of a much enlarged spleen, recurring jaundice, finger-clubbing, and impairment of growth, but without ascites. Now I am very sceptical as to the existence of Hanot's cirrhosis at all, and still more sceptical as to the occurrence of such cases in the child. I once thought I had such a case—I have described it elsewhere—but it proved post-mortem to be a case of partial obliteration of the bile ducts, presumably of congenital origin. I shall, however, be interested to hear the opinions of others on the subject.

8. *Splenomegaly the Result of Splenic Thrombosis.*

That thrombosis of the splenic vein could cause enlargement of the spleen was denied by Osler, yet there seems to be no doubt that it does happen. I have myself seen two cases in the adult in which this was proved at the necropsy to be the cause, and a case of it has been published by Parkes Weber. Wallgren, in an important paper, has drawn attention to it as a cause of splenomegaly in children, and believes that it is commoner than is supposed, but that it has hitherto been confused with Banti's disease. He describes the leading features of the syndrome as splenomegaly, anæmia with leucopenia, and slight ascites. Sooner or later hæmatemesis sets in, and after a bleeding the volume of the spleen *shrinks*—this, he believes, does not happen after hæmatemesis in Banti's disease or in cirrhosis—and at the same time a temporary leucocytosis appears. The liver in all of his cases coming to necropsy was found to be normal.

He is of opinion that the thrombosis of the splenic vein is the result of trauma or of an "infection," and that it leads to engorgement of the spleen and dilatation of the veins at the lower end of the œsophagus, rupture of one of which causes the hæmatemesis, with temporary subsidence of the splenic tumour. Wallgren believes that the prognosis in these cases is bad unless splenectomy is performed.

9. *Splenic Anæmia of Adult Type and Banti's Disease.*

It will be generally agreed, I think, that "splenic anæmia" and "Banti's disease" are to some extent diagnostic "rag-bags" into which are thrown all the cases of enlarged spleen that cannot be placed in any other category. None the less it will be admitted that cases to which these terms are applicable have a real existence in the adult, and the question for us to-day is whether they are also met with in childhood. Now, seeing that the splenic anæmia of adults is of its essence a very prolonged disease, the final stage of which, when cirrhosis of the liver has supervened (so-called Banti's disease) is only reached after some years, it follows that Banti's disease at least is not likely to be met with whilst the patient is still a child. In spite of this I think the diagnosis "Banti's disease" is sometimes justified in childhood.

The difficulty, of course, is to distinguish such cases from those of idiopathic cirrhosis "with splenic predominance," already referred to. It can only be done if the history shows that the spleen was enlarged for some years (as in the above case) before signs of cirrhosis supervened, for the cases of idiopathic cirrhosis seem to run their whole course in a comparatively short space of time. There is little doubt, too, that cases of splenomegaly due to splenic thrombosis must often have been included under the term "splenic anæmia or Banti's disease," and so, probably, have some syphilitic cases and some of acholuric jaundice.

It is sometimes asserted that the presence of leucopenia puts a case in the category of splenic anæmia rather than of idiopathic cirrhosis, but to this I cannot agree. In the case of idiopathic cirrhosis with splenic predominance which was described earlier in this paper, for instance, leucopenia was present, and my own view is that leucopenia tends to be a feature of most chronic splenomegalies, no matter of what origin, and that little diagnostic value can be assigned to it.

The treatment for splenic anæmia of the adult type, we should all agree, is splenectomy, but whether the operation is worth doing after cirrhosis has supervened—that is, in Banti's disease—is a matter for consideration.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In conclusion, I would suggest as the most important points for us to discuss: (1) the part played by syphilis and rickets in the production of chronic splenomegaly; (2) the nature of idiopathic cirrhosis with "splenic predominance" and its differentiation from Banti's disease; (3) the existence or otherwise of biliary cirrhosis with splenomegaly; (4) the frequency of splenic thrombosis as a cause of enlarged spleen and its diagnosis from other forms of splenomegaly; (5) the occurrence of cases of splenic anæmia of the adult type and its sequel, Banti's disease, in childhood.

As regards treatment, debate must chiefly centre round the question of splenectomy. As to this, I would agree with Dr. Leonard Parsons that the cases suitable for this operation are those which show a negative Wassermann reaction, no enlargement of lymphatic glands, and no characteristic leucocytic picture, but in which there is some degree of anæmia, associated with (1) leucopenia, or (2) increased fragility of the red cells, or (3) hæmatemesis. There may be difference of opinion, however, as to the advisability of removing the spleen in Gaucher's disease and in cases with cirrhosis of the liver, whether of the idiopathic or Banti variety, even although these fall within the limits of the above criteria.

The Therapeutic Value of Valerian.*

By J. S. MANSON, M.D., D.P.H.

(*Brit. Med. Journ.*, Nov. 10, 1928, p. 842.)

I HAVE been greatly impressed with the success of valerian therapy in a large variety of cases of the minor neuroses. The drug was given in the form of the ammoniated tincture of valerian combined with 10-grain doses of potassium bromide. I soon found that the bromide, while adjuvant, was not the essential part of the therapeutic value of the mixture, for if the bromide was given without the valerian the result was less successful or was even a failure. I attributed the action of the valerian to its effect in reinforcing optimistic suggestion through the sense of smell—a psychic rather than a physical or chemical action. Dr. Dan McKenzie, in his book on "aromatics," shows how important is the sense of smell in awakening dormant memories of past experience, and Mr. John H. Kenneth of Edinburgh University had an interesting note in the *British Medical Journal*, 3rd June, 1922 (p. 904), on "osmics and psycho-analysis." Mr. Kenneth thought that osmics—the science of smell—might be of use in psycho-therapeutic practice.

The observations of Mr. Kenneth rather confirmed me in the view that the action of valerian was chiefly psychical. It produced an olfactory stimulus, which in time caused a break up—if I may use the term—of complexes associated with fear and anxiety of external circumstances, or of apprehension of the functional working of the organs of the body—in other words, hypochondriasis.

Further experience in the use of valerian, especially the constant good results obtained when given in the type of case for which it seemed indicated, made me think that valerian had a more definite action due to some chemical factor rather than to an indirect psychical stimulus.

Let me give in general terms the type of case in which I think valerian is indicated. The symptoms usually described are: palpitation, something rising in the throat, flatulent eructations, rumbling of the bowels, sense of pressure on the vertex, desire to be alone, and lack of interest in home and social surroundings, fear of something going to happen, unrestful sleep accompanied by disturbing dreams, lack of mental concentration, and general depression, so marked at times that thoughts of suicide creep into the mind—in other words, the first stage of melancholia.

Women are more affected than men, but I will give an illustrative case which occurred recently in my own practice.

The patient, a man aged 54, was organically sound; he was a confidential clerk in an important firm of solicitors dealing with the administration of large estates. He had nearly all the symptoms described above, and became totally unfit for his work. His firm, appreciative of the value of his services, sent him to a leading consultant, who, after a thorough overhaul, advised a two months' holiday at the seaside, and prescribed glycero-phosphates and other so-called nerve tonics to be taken regularly. On his return from his holiday by the seaside he found himself as bad as ever, and could not concentrate on his work.

When he came to see me he described the misery of the seaside holiday. Each vacant day was succeeded by another one, allowing him time to brood over his troubles. I advised him to continue at work, but only to do such work as to maintain his interest, and to avoid the mental fatigue involved in calculations. I gave him the ammoniated tincture of valerian in half-drachm doses and 7½ grains of potassium bromide.

In three weeks his confidence had returned, and after six weeks he could undertake full work involving intense mental concentration in complicated problems of finance. During that period he had taken 12 oz. of the ammoniated tincture of valerian. He has had one or two tendencies to relapse since, but he returns for his smelly mixture to keep him up to the mark.

Similar cases could be cited, but they would be wearisome; suffice it to say that I am convinced that there is enough evidence to show that valerian does contain some definite property which has a decided and specific beneficial action on the higher levels—and perhaps also on the lower—of the central nervous system.

Continental pharmacologists have given more attention to valerian than their British colleagues, but even on the Continent research has been very limited, and the literature, such as it is, is not of recent date. The best account I have been able to find is an article in the *Pharmaceutical Journal* of 19th November, 1921 (p. 402), by Dr. N. Smodlaka of the Ministry of Health, Belgrade, entitled "The history and therapeutic properties of valerian." In this article Dr. Smodlaka described three experiments on frogs carried out by Professor Wicki at the Pharmacological Institute at Geneva. The frogs were immersed in 1 per cent., 2 per cent., and 3 per cent. solutions of the liquid extract of valerian, and observations made of their behaviour. Dr. Smodlaka concludes that his experiments prove that the extract prepared and made by him was of high physiological activity and paralysed the brain of the frog in small concentration. He described the drug as an antispasmodic, because it depressed psychical action.

These experiments on the frog do not help us very much to understand the action of valerian on the human subject; all they do is to show that valerian has a definite action on the nervous system of the frog due to some chemical factor in the drug. It is stated by Cushny that valerian contains borneol, or Borneo camphor, and numerous esters of acetic, formic, and valerianic acids. Is it possible that this borneol is the important active principle in valerian?

The action of camphor in depressing the brain and spinal cord is well known, but whether the allied borneol is the valuable active agent is a question to be determined by pharmacologists. All I have tried to show is that valerian is a very valuable drug in general practice, capable of restoring mental efficiency and alleviating mental misery. It has also the advantage of having no deleterious properties such as are associated with the habit-forming narcotic series of drugs. It seems to be a drug well worthy of further research into its properties and action on the nervous system.

A New Test for Pregnancy.

(*Lancet*, October 27, 1928, p. 876.)

ONE of the commonest, and at the same time often one of the most difficult tasks that fall to the lot of the

* A paper read in the Section of Therapeutics and Pharmacology at the Annual Meeting of the British Medical Association at Cardiff, 1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

medical man is the early diagnosis of pregnancy. There are few conditions which involve such deep-seated and complex changes with so little demonstrable effect. Some recent workers have put forward a test for pregnancy which is founded on a new principle—the presence of certain hormones in much increased amount in the blood and urine during pregnancy, and the demonstration of their presence by simple biological tests. These hormones are those of the ovary and of the anterior lobe of the pituitary. With the ovarian hormone the laboratory worker is now well acquainted; the proof of its isolation and action in promoting the growth of the uterus and bringing about œstrus in castrated female animals is complete. The nature of the anterior pituitary secretion is not yet quite so well defined. Since Pierre Marie in 1886 described the condition of acromegaly and observed that the disease was associated with tumours of the pituitary body, the nature of the effect of the anterior lobe on growth has monopolised the attention of scientific workers. Its interrelationship with the ovaries has long been suspected, however, and during the last two years has been strikingly confirmed by B. Zondek and S. Aschheim in Germany and independently by P. E. Smith and E. T. Engle in America. The hormone is supposed to act through the medium of the ovary, in which it brings about rapid growth of the Graafian follicles and in the immature animal may induce a premature œstrus. The work of A. C. Siddall and of Zondek and Aschheim, is based upon the experimental proof of the increase in amount of these hormones in the blood and urine during pregnancy. Siddall's work depends on the presence of ovarian hormone in the blood of the woman whose pregnancy is to be tested. Her serum is injected daily in doses of 1 c.cm. into an immature virgin mouse for six days. On the sixth day the mouse is killed and weighed and the ratio of the weight of the whole mouse to the combined weight of the uterus and ovaries is estimated. If the ratio is less than 400 to 1 the test is regarded as positive. In 142 cases examined nine were erroneous. It is during the early months or weeks of pregnancy that the test would be useful in practice, so that it is noteworthy that in 19 tests on women less than three months pregnant only one erroneous result was recorded. Zondek's test depends on the assumption that the anterior pituitary hormone is the activating factor. It is present in traces in normal urine, but according to Zondek the commencement of pregnancy is quickly followed by an explosive production of anterior pituitary hormone which is excreted in the urine. If samples of the urine from pregnant women are injected into young female mice in suitable doses, and the mice are killed in five days, their ovaries show hæmorrhagic centres and corpora lutea. This phenomenon is said to occur also when an extract obtained directly from the anterior portion of the pituitary gland is injected, but not when urine from males or non-pregnant females is injected. The results obtained by Aschheim using this method, are remarkable. Of 258 control urines examined, four were positive, whereas of 197 specimens of urines from pregnant women only four gave a negative result. The validity must rest upon the confirmation of these experiments by other workers. If some biological test unconnected with the genital system for the presence of anterior pituitary hormone could be devised, the fact that this hormone is the activating substance would be even more clearly demonstrated. The Zondek test is thus of the utmost practical importance and it seems probable that in the near future it may be developed into a standard test which can be carried out with little trouble in any laboratory equipped for biological work, with only a very small chance of error in the results.

Treatment of Asthma in Children with Tuberculin.

By T. M. LING, B.M., OXF.

(*Lancet*, Nov. 10, 1928, p. 972.)

WITHIN the last few years considerable interest has been reawakened in the treatment of asthma with small doses of tuberculin, the credit for this being due primarily to W. S. van Leeuwen, of Leiden.

Van Leeuwen, working with a large series, claims that about 50 per cent. are almost completely cured, about 25 per cent. are improved, and 25 per cent. are uninfluenced. Most of the patients so treated have been adults and therefore it was considered to be of interest to try the effect of this treatment on children. Twenty-four asthmatic cases were therefore chosen from the children's out-patient department at St. Thomas's Hospital, all of whom had been receiving treatment for not less than two years, while many of them had had symptoms for a considerably longer time. The treatment that had been given previously was potassium iodide by the mouth and injections of adrenalin during the attacks, while any source of infection in the mouth or nasopharynx had been eradicated.

As a preliminary measure all the cases were examined clinically and radiologically to exclude as far as possible pulmonary fibrosis and enlarged mediastinal glands. Some of the French literature recently has suggested an association between congenital syphilis and asthma and consequently all the cases were examined with this point in view; no suggestive clinical signs were found and the Wassermann reaction was negative in every case. The average age of the patients was 7.5 years.

Cutaneous Pirquet reactions were done in all cases and 45 per cent. gave definitely positive reactions.

Method of Treatment.

In all cases Old Tuberculin (Burroughs Wellcome and Co.) was used and injections were given subcutaneously once a week. As the children were out-patients, it was not feasible to see each case on the day following the injection, but the mothers were instructed to note any general or local reaction that occurred; 385 injections were given and a general reaction was noted in two cases, while a history of a definite local reaction was given in five cases.

The usual procedure was to start injections with 0.1 c.cm. of a dilution of 1 in 1,000,000 and increase the dose on each occasion by 0.1 c.cm. or 0.2 c.cm. until 0.1 c.cm. of a 1 in 100,000 dilution was reached. Beyond this the dose was increased very gradually until the optimum quantity was found for each individual case. When once the correct quantity is obtained, it is not advisable to increase the strength of the injection as an attack of asthma is liable to be brought on. On two occasions this occurred within an hour of the injection, where the strength had been increased unduly quickly.

Two separate courses of treatment have been given with an interval of two months. Naturally the individual attendances were sometimes irregular, but for the whole group it was excellent, and the willingness and enthusiasm with which the mothers brought up the children week after week is probably the best indication of the efficacy of the treatment, particularly as each injection necessitates a certain amount of pain for the child. The average number of injections in the first course was 15 and in the second 10; thus it can be seen that the treatment takes a considerable time.

Results.

Of the original 24 cases, three were unaffected by the treatment and were discharged, while two discontinued treatment as they left the district. The remaining 19 had regular treatment, with occasional weekly lapses owing to intercurrent illness, and are all improved. The word "cure" admittedly should be used with greater caution than usual in asthma and only two cases could be included under this heading. The remaining 15 cases remained practically free from symptoms while under treatment, but lapsed to a varying degree between the course and since treatment was discontinued. In asthma the patient's symptoms are the only index of the severity of an attack, and in every one of these cases the mother was emphatic that the attacks were

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

much less severe and less prolonged than previous to treatment. A careful record was made in each case of the average interval of freedom from attacks previous to treatment and subsequent to the latter this interval has been increased by approximately 30 per cent.

Conclusions.

Admittedly the results are not striking and do not harmonise with van Leeuwen's claims that 50 per cent. of cases are curable by this means. On the other hand, it is justifiable to state that the frequency and the intensity of the asthmatic attacks can be diminished and this in itself is a justification for a more extended trial and for the inclusion of tuberculin among the methods of treatment of the established disease.

The Idea and the Method in Medical Research.

(*The Journ. Amer. Med. Assoc.*, October 13, 1928, p. 1111.)

CLAUDE BERNARD, in his "Introduction à l'étude de la médecine expérimentale," summed up briefly the relationship between the idea and the method in research:

"The experimental method cannot give new and fruitful ideas to men who have none; it can serve only to guide the ideas of men who have them, to direct their ideas and to develop them so as to get the best possible results. . . . As only what has been sown in the ground will ever grow in it, so nothing will be developed by the experimental method except the ideas submitted to it. The method itself gives birth to nothing. Certain philosophers have made the mistake of according too much power to method along these lines."

In view of the emphasis placed to-day on scientific interest and research in our medical schools, and of the large and increasing numbers of persons engaged in medical research, it appears worth while to restate the relative importance of the idea and the method, with some indication of the contributions to medical knowledge that may be expected from various types of research. To quote Claude Bernard further, "Men with a presentiment of new truths are rare in all the sciences; most men develop and follow the ideas of a few others. . . . We usually give the name of discovery to recognition of a new fact; but I think that the idea connected with the discovered fact is what really constitutes the discovery." Obviously, only a small proportion of those actually engaged in medical research are born investigators; what may be expected, then, from the vast majority in whom training in the methods of investigation is substituted for creative genius? From the majority of them, nothing! Included among these are the large numbers of young men who try their wings and fail to discover a real liking or aptitude for scientific work. Yet their seemingly futile efforts must not be regarded as waste, since from the ranks of the beginners must be drawn the successes as well as the failures. Moreover, no one, however inept, can have first hand contact with the difficulties of advancing knowledge without carrying away with him some appreciation of the scientific method and of the way in which progress is made. The tragedy comes only when the misfit, through bad judgment or advice, continue to go through the motions of research instead of striving for a career in other directions.

From another group may be expected accurate observation, particularly valuable in establishing new facts or in confirming the results of others. Thus every discovery of a new therapeutic method must be subjected to widespread trial and, on the results of such trial, finally accepted or rejected. Much of this trial is quite unscientific, but there are now sufficient numbers of scientifically trained observers to make possible the rapid evaluation of any newly introduced therapeutic method, so that the issue does not remain long in doubt. Many of these observers are clinicians, scientifically trained, who find time in the busy routine of practice to observe accurately, and their contributions to medical knowledge must not be undervalued.

Still another group, working either in the laboratory or in the clinic, are capable of painstaking contributions by what may be called the analytic method. This method, which is the one employed by the majority of established investigators, varies from the minor set-piece of research, the German *arbeit*, to elaborate investigations having as an object the analysis of natural phenomena, with the hope of resynthesis and complete understanding of the subject under investigation. It may be and usually is employed by the investigator well trained in scientific method but lacking in original ideas, and from the method come many pieces of solid contribution to knowledge. The only danger here lies, as pointed out by Claude Bernard, in attributing too much power to method as a substitute for ideas.

Finally come the favoured few in whom the value of the idea transcends all questions of method. Theirs are the intellects which are so endowed as to perceive and grasp the subtle and delicate relations which exist but of which the average mind is not aware. An idea arises in such a mind which "may be a sort of intuitive anticipation of successful research." From these few, and from these only, may we expect great and strikingly original contributions to medicine. That they must use the methods common to all investigators in establishing the truth of their ideas is of course understood, but the place of method in their lives is distinctly subordinate to the idea—and rightly so!

Dental Disease and Dietetic Deficiency.

By C. F. BADCOCK, L.D.S., R.C.S. (Eng.)

(*The Dental Record*, April, 1928, Vol. XLVIII, p. 186.)

DENTAL caries is classed by Prof. W. D. Halliburton and others under the head of "Deficiency Diseases," and it has been suggested that pyorrhœa alveolaris is also a deficiency disease. Are these diseases of the teeth correctly so described?

I. INTRODUCTORY.

(1) A *deficiency disease* is a disease of which the definite cause is a deficiency of one or more of the accessory food factors or "vitamins." The class of diseases is in marked contrast to that much greater class associated with a positive agent—chemical poison, pathogenic organism, etc.

The typical deficiency diseases are rickets, scurvy, beri-beri, and pellagra. All these diseases are directly due to the *absence* of certain indispensable ingredients of a natural diet, and in no way to the *presence* of micro-organisms or other active irritants.

(2) The known vitamins are: water-soluble B, deprivation of which is the cause of beri-beri, and possibly pellagra; water-soluble C, deprivation of which is the cause of scurvy; fat-soluble A, D and E, deprivation of which is said to induce ophthalmia, rickets, and sterility, respectively.

"Each of the vitamins is essential to nutrition, and each has a special function in the regulation of constructive metabolism."

(3) Vitamins appear to have a catalytic or enzymic action on the functioning of the endocrine glands, and probably on that of the assimilative endothelia. If the organism is deprived of vitamin D the hormone, particularly of the parathyroids, is affected, calcium metabolism in consequence becomes deranged, and, whether or not there is an actual lack of calcium in the dietary, the disease called "rickets" is caused. When rickets occurs, which it generally does, during the time when the tooth germs are being calcified, the calcium content of the blood is insufficient to permit of an adequate supply of calcium salts for this process. The calcifying tooth germs therefore suffer from *calcium deficiency*, and, correlatively with the under-ossification of bone, become under-calcified or hypoplastic. The hypoplasia or defective development of enamel and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

dentine exposes these tissues to putrefaction by micro-organisms, which condition is known as "dental caries."

Rickets indirectly, and calcium deficiency directly, both due to want of vitamins, may thus, by starving the developing enamel and dentine organs of their due supply of calcium, help to deprive the subsequently formed tissues of their natural defence against bacterial attack.

(4) Disease is said to be the reaction of the tissues, or the organism, to injury, but in one's concept of a particular disease the injury itself is usually included.

The causes of disease can generally be classified into predisposing and exciting.

"Predisposing causes are conditions which act upon the living organism so as to render it susceptible to outside agents, and exciting causes are those agents themselves. Thus, starvation may render a person susceptible to attack by a parasitic organism which would otherwise be unable to settle in his tissues and cause disease." (Green's "Pathology.")

We may note that the specific cause of the disease is the particular organism concerned, not the starvation.

It follows that *preventive* treatment is removal of the predisposing cause, while *curative* treatment consists in the removal of the exciting cause and repair of the damage done.

II. DENTAL CARIES.

"Dental caries" is essentially a fermentative disintegration, or putrefaction, of the special calcified dental tissues. This affection of the teeth has retained the unfortunate name "caries" given to it by the older writers; needless to say, it is not analogous to rarefying osteitis.

"Bacteria are the sole initiating cause of dental caries." (J. Leon Williams.)

Unless the dentine be exposed by the loss of its enamel-covering owing to defects in development or to traumatism, dental caries must first attack the enamel, and this is the usual mode of its commencement in a susceptible subject.

Carbohydrate material adhering to, or held in contact with, the enamel surface becomes inoculated with fermentative bacteria present in the oral saliva. The acids (chiefly lactic acid) formed under the protection of the zooglœa films or "bacterial plaques," described by G. V. Black and J. Leon Williams, decalcify the enamel. The zooglœa film serves to protect the organisms from the air and from the cleansing action of the saliva, while permitting the permeation of carbohydrates in solution.

The nascent lactic acid attacks the enamel surface, combining with its calcium salts to form calcium lactate. The interprismatic substance is first dissolved, the rods being detached and rendered friable, and a cavity is formed, by the deepening of which the bacteria obtain access to the dentine. Enamel caries then becomes complicated by the more complex phenomena of dentine caries.

Dentine, unlike enamel, is an organic tissue—less so, however, than bone—having a central cellular medulla (or myelos), the dental pulp, freely supplied with blood vessels and nerves, and so exhibits *reaction* to the bacterial injury. On the other hand, the dentine tissue offers practically no resistance, and succumbs readily its decomposition proceeding much more rapidly than that of enamel. The progressive destruction of the dentinal fibrils excites hyperæmia in the pulp tissue. The resting odontoblasts are stimulated into renewed activity, the first evidence of which is calcification of the fibrils in advance of the encroaching caries, so obliterating the tubules and forming the "translucent zone." The second stage of odontoblastic activity is the laying down of a coating of secondary or "adventitious" dentine on the wall of the pulp chamber where it has been dangerously thinned. On the further progress of the disease, inflammation of the pulp (odontomyelitis) ensues, and on the bacteria reaching the pulp the inflammation becomes suppurative. We observe, then, in dental caries the necessary factors of a disease; the injury, and the reaction of the tissues—we may also say, the reaction of the organism, as, consequent on a marked improvement in the general health, the decay is occasionally seen to be arrested in the affected teeth, the denuded translucent zone showing up as a slightly concave facet of considerable extent and hardness, presenting a pigmented and burnished surface. We may, therefore, clearly recognise that the exciting or direct cause of dental caries is the presence of zooglœa masses of bacteria in contact with the enamel and supplied with carbohydrate nutrient material, and that the nature of the disease is a putrefaction of the calcified dental tissues.

There are several circumstances which may predispose to dental caries. These predisposing causes may be divided into two classes, those operating before tooth eruption, and those operating afterwards.

Operating Before Tooth Eruption.

(1) Malnutrition, rickets, and the exanthematous fevers, leading to hypoplasia of enamel and dentine; macroscopic hypoplasia being due to the exanthemata, and microscopic hypoplasia to malnutrition and rickets, and to vitamin and calcium deficiency.

(2) (*a*) Deficiency of the fat-soluble group of vitamins. This lack of accessory food-factors deprives the parathyroids of the necessary stimulant for the production of their hormone, which is regarded as the chief factor in the regulation of calcium metabolism, and so checks the supply of calcium salts to the developing dental tissues. The calcium content of the blood must be kept at the physiological level, and, if the supply is deficient, this desideratum is effected at the expense of the calcifying tooth germs.

(*b*) Lack of calcium, magnesium, and phosphorus in the diet.

Clinical experience, in places where special measures have to be taken against infective disease, goes to show that a great deal of infantile rickets, and of dental caries of the deciduous teeth, follows the use of boiled milk for infant feeding, etc., and of boiled drinking water. In the former case the fat-soluble vitamin is destroyed by heat, and in the latter the mineral salts are precipitated, so that the child is deprived of these two most important factors in calcium metabolism. In places where a pure fresh milk and spring water supply cannot be obtained, the pasteurisation of milk and the efficient filtering of water should be employed, or, as an alternative to the latter, a physiological proportion of lime salts added to the boiled water. The danger of infection, especially in tropical countries, is apt to overshadow other considerations, and the simplicity of boiling may become a snare.

The above-mentioned causes must operate some time during the period of development of the dental tissues formed from the tooth germ, i.e., from about the fourth month before birth to about the eighteenth year, and must be effective on the individual teeth before their eruption. They will result in defective development of the calcified tissues, and so predispose these tissues to dental caries.

Operating After Tooth Eruption.

(3) Hypoplasia of the enamel.

The possibility of the re-calcification of the hypoplastic enamel after its exposure in the oral cavity has been mooted. Malleson, Livingston, Caush, and others, have demonstrated that most enamel (in European teeth, at any rate) is stainable, that is, that there are minute crevices between the rods, presumably where the interprismatic substance is in defect, so that the enamel is permeable. This permeability, they consider, should permit of the adsorption of salt solutions from either the oral or dentinal surfaces into the enamel, and thus of possible progressive calcification after tooth eruption.

There is so far no certain evidence that this ever happens. Molecular changes no doubt take place in enamel as age advances. We note, for instance, that after middle age it gets stained and tends to split. But there can never be a true physiological calcification, such as that of a fibril in the translucent zone of dentine. Whatever "calcification" does occur can only be a crystalloid precipitation of salts in such spaces as are accessible, and such an accretion of inorganic lime would hardly be a protection against dental caries

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

cults have been allowed to practice in any community, nor how great the number of medical pretenders may have been.

I have joined in the defence of the public health when efforts were being made to strip the health officials of their legal right to employ measures which scientific experience had proved to be invaluable in the prevention of disease. The thought has obtruded itself again and again that the medical profession should not bear the brunt of the burden to defend a community against exploitation. The medical profession would of course under no circumstances withhold its aid, or be passive in the face of resistance to the progress of preventive medical science.

It has appeared signally strange that we have not before this brought it home to those who are the leaders of thought in every community that the burden of protecting the community devolves in equal measure on every intelligent and sane person who has the well being of his fellows at heart. The time has come when, ignoring the insane, fanatical or mercenary fringe who seek to exploit the credulous or the psychopaths, we ought to make it clear to every community that it can have only such public health protection as it is willing to fight for. The defence ought not to depend on the medical profession alone.

The cause of public health will be tremendously promoted if physicians serve notice on the influential and well balanced editors, pulpit occupants, leaders of women's clubs, merchant and trade associations, and civic organizations of our respective communities generally, that, in the future, the medical profession will not be subjected to the charge that it is a medical trust seeking to bar out competition, when in reality its effort is to protect the community from pretenders, frauds, charlatans and quacks of all kinds and degree who would mercilessly exploit the public.

When legislation is proposed that threatens the public health, there ought to be a strong and compact organization of those civic groups in the community whose education and civic spirit make them the proper leaders of the public, and they ought to rise and lead in opposing any efforts that threaten the public health. The medical profession should join such groups to make available the scientific facts and knowledge that have been gleaned during the comparatively short period of development of what may truly be termed scientific medicine.

Physicians who stand aloof from Public Health.

We must not express too great impatience or be too harsh in our judgment if the community as a whole has failed to shoulder the burden of protecting the public health, because we find not infrequently that physicians draw away in a certain haughty aloofness from interest of participation in public health work. Time and again it has been the experience of those physicians who have chosen public health as a career to discover among their confrères a certain air of condescension if not of utter disdain for public health work and those who carry it on. I have frequently encountered physicians who make no disguise of their indifference to public health. Not infrequently a physician has written that he is not interested in this or that public health enterprise on the peculiar ground that he is a surgeon or some type of specialist. What can be expected of the laity, if physicians will not manifest interest in public health? If the practice of a speciality in medicine becomes so narrowing in its influence, it is either a reflection on the excessive lengths to which specialism has gone or else is clear evidence that the physician who disclaims an interest in public health is merely a high grade mechanic. He has not the quality of mind or heart that entitles him to call himself a physician with all that the term connotes by reason both of tradition and of the general expectation that the physician shall of all groups be distinguished for his desire to avert disease and death so far as possible, and to reduce the need for curative work to the lowest possible degree by promoting methods for the prevention of sickness.

Colleges and Hospitals in relation to Public Health.

It would be most desirable if health centres were conducted by health departments at medical schools as a co-operative effort for purposes of teaching. Students will never acquire a wholesome respect for public health work and be its active allies unless they serve an apprenticeship in field and clinical work in relation to public health and learn from experience how certain preventable diseases can be prevented.

This will make for the mobilization of all health and medical services into as few units as possible, or, to put it differently, it will prevent their dispersion. The hospitals are too frequently merely casualty stations. They ought to serve as health centres as well, and provide facilities for the conduct of the varied types of treatment and service that are now familiar public health functions.

Industrial Hygiene, the Cretin of Public Health Medicine.

In spite of our tremendous advances in industrial development throughout the country, there has been comparatively little growth in industrial hygiene as distinguished from what is essentially first aid service in industry. There are a few noteworthy exceptions. Of intensive work in industrial hygiene conducted by municipal health departments, there is little or no evidence.

Reviews.

BLOOD-PRESSURE: ITS CLINICAL APPLICATIONS. —By G. W. Norris, A.B., M.D., H. C. Bazett, M.B., B.Ch., F.R.C.S. (Eng.); and T. M. McMillan, A.B., M.D. 4th Edition. London: Henry Kimpton. 1928. Pp. VIII plus 387 with 47 engravings and 1 coloured plate. Price 21s. net.

ENCOURAGED by the cordial reception accorded to the first three editions and in view of the appearance of important literature on the subject, the authors have brought out the fourth edition of their book on "blood pressure; its clinical applications." The book, the authors point out in the preface, has been considerably rewritten and the chapters dealing with physiology are entirely new. The chapters on physiological considerations give an excellent summary of the physiological aspects of the problem of circulation and give adequate attention to the capillary and venous pressures, embodying the recent researches on the subject. The methods of instrumental measurement of blood-pressure in arteries, veins and capillaries are given in detail. Tests to determine functional efficiency of circulation like Crampton's test, Schneider's test, Barringer's test, will prove of value to the clinician. Chapters on hypotension and on blood-pressure in infectious disease are interesting and enable one to understand these conditions fully and to appreciate the line of treatment to be adopted. Arterial hypertension is fully dealt with and the general and medicinal treatment of this important pathological condition is thoroughly discussed. Three chapters are devoted to the study of blood-pressure in cardiac diseases, in arteriosclerosis and to blood-pressure in relation to endocrine glands, etc. The study of blood-pressure in surgery, in diseases of the central nervous system, in obstetrics and in ophthalmology are specially contributed to by experts on these subjects and are very interesting and instructive.

The book is valuable from both the physiological and clinical points of view and gives a clear picture to the clinician of the circulatory changes that occur in the body in various conditions that he is called upon to treat. Reference made to the treatment of various pathological conditions will no doubt be of great use to the clinician.

R. N. C.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PATHOLOGICAL PHYSIOLOGY OF INTERNAL DISEASES. Functional Pathology.—By Albion Walter Hewlett, M.A., M.D., B.S. Revised Edition. 1928. New York & London: D. Appleton and Co., Pp. 787 with 164 illustrations. Available from Butterworth & Co., Calcutta. Price Rs. 26-4 net.

THIS, the third edition of this comprehensive book dealing with the changes in the functions presented by patients suffering from internal diseases, is very welcome. Although the plans for complete revision were outlined by Dr. Hewlett himself, owing to his untimely death, this work had to be carried out by a board composed of a number of his colleagues. The revision of a book like this is a difficult task as it involves a systematic consideration of all the recent advances in the different realms of applied physiology, biochemistry, immunology, hæmatology and clinical medicine. The revising board have, however, done justice to all these subjects as presented in the book and the physician gets an insight into various physiological concepts which are so essential to the rational interpretation of symptomatology in modern medicine. The chapter on the dynamics of the heart muscle is fairly lucid but in places the subject-matter appears to be summarily dealt with. The study of capillaries has not received proper attention, and in view of the fact that a lot of work is done on the vitamins this subject might have received fuller consideration. The chapter on metabolism, especially the section on acid-base equilibrium, is very instructive. The chapter on pernicious anæmia summarises the confusing and rapidly growing literature on the subject. The chapters on hæmatology and immunology are very comprehensive; although the recent conceptions about the pituitary and gonads have not been included, the chapter on endocrinology, on the whole, is worth reading. The bibliography appended at the end of each chapter needs special mention. The references are mainly collected from English books and periodicals and ought to be most useful to the English-reading population.

R. N. C.

LABORATORY DIAGNOSIS AND EXPERIMENTAL METHODS IN TUBERCULOSIS.—By Henry Stuart Willis. London: Baillière, Tindall and Cox. 1928. Pp. XXV plus 330 with 25 figures in the text. Price 16s. net.

THIS well-illustrated book is written by an author with considerable laboratory experience in tuberculosis. The aims of the book are twofold, to describe some of the more important methods of the laboratory diagnosis of tuberculosis and to consider some of the more significant procedures and principles involved in the experimental study of the infection.

The first chapter gives a useful description of the various exudates and transudates found in tuberculosis and the methods of obtaining and examining them. The demonstration of tubercle bacilli by staining is fully discussed in the second, and in the two following chapters the discovery of bacilli by concentration and animal inoculation are described. Thereafter the bacillus itself and the various culture media used for its growth are dealt with.

In the third part of the volume, diagnosis by tuberculin is discussed and in the fourth tuberculo-complement and other serological tests are dealt with.

The fifth part is devoted to the inoculation of animals with the tubercle bacillus. In this section there is a useful description of anatomical methods for the injection of animals with coloured injection masses, and vital staining is described; there are also a few statements concerning allergy and immunity to tuberculosis.

The description of histological technique in the fifteenth chapter is excellent and the book ends with a list of equipment for a tuberculosis laboratory and a very complete bibliography.

The style is lucid and abstruse parts of the subject are made easy to understand. There are many practical hints which will be found useful even by those working on other diseases besides tuberculosis.

For the thorough understanding of the laboratory side of tuberculosis, no better book could be recommended to the medical practitioner or student and it will be found a useful work of the reference on the bookshelf of the experimental laboratory.

The following quotation from the introduction by another worker at the Johns Hopkins University well describes the scope of the book:—"It is not to be doubted that we have now passed the time when the needs of the worker, interested with any of the myriad facets of tuberculosis, can be best served by a multitude of unrelated sketches and references scattered over and throughout a terrain that is as long and broad as the multipartite divisions of modern medicine. A germ that habitually bears down upon almost every organ and tissue of the body necessarily creates a corpus of diagnostic method that is commensurate with the unrivalled multiplicity of its pathological and clinical manifestations. The works on urology will present their share of the diagnostic procedures of tuberculosis, the works on orthopædics theirs, on gastro-enterology theirs, and so on; until to-day the laboratory diagnosis of the infection can be got at only in discouragingly piecemeal fashion by practitioner, student, or professional technician. For bringing together within a single volume these numerous diversified methods and for appraising them to the enlightenment and profit of the unspecialized worker, Doctor Willis deserves the thanks of the medical profession."

E. M.

VARICOSE VEINS.—By Ronald Thornhill, M.B., Ch.B. London: Bailliere, Tindall and Cox. 1929. Pp. XI plus 63 with 1 figure. Price 5s. net.

THIS book deals with varicose veins "and their treatment by *empty vein* injection." It is one of the many replies which are constantly being made to those unthinking people with cramped intelligence, who say that it is not likely that any essential advance will be made in treatment by medical men when it is to the patient's advantage and their own disadvantage! Sir Berkeley Moynihan in a foreword states that "a new, simple, safe, quick device has been found for dealing with conditions formerly remediable only by extensive and protracted methods."

The author speaks from a large experience, and discusses in successive chapters the etiology and pathology of varicose veins and the details of the injection treatment. The quinine urethane injections are usually employed, but it is probable that even better chemical solutions than this will be discovered. Many thousands of cases have now been treated, so that the method is based on a satisfactory foundation; above all its safety is assured, for cases of embolism are almost unknown.

Medical practitioners will welcome this small book as a guide to a new and efficient method of treatment for a condition which may be distressing and difficult to deal with by operative procedures.

F. P. C.

RESEARCHES IN POLYNESIA AND MELANESIA. PARTS V—VII.—By P. A. Buxton, M.R.C.S., D.T.M. & H. Published by the London School of Hygiene and Tropical Medicine. 1928. Pp. XI plus 139 illustrated. Price. 9s. net.

"RESEARCHES in Polynesia and Melanesia" embodies the results of the investigations in Samoa, Tonga, the Ellice Group and the New Hebrides in the years 1924, 1925; and parts V—VII under Professor Buxton's authorship are got up together in a neat volume of 139 pages with 27 text figures—No. 2 of the memoir series of the London School of Hygiene and Tropical Medicine.

Part V of the volume which is devoted to studies in filariasis is divided into the following sub-divisions (*a*) Methods, (*b*) Normals, (*c*) Pathological conditions, (*d*) Filariasis in Oceania, and (*e*) Summary. In the "Foreword" the author explains that though according to their original programme the study of filariasis was not intended, a stay of some months in the Samoan islands impressed on him the necessity to devote some attention to that disease and that filariasis is discussed in the book in relation to the other work done in Oceania.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

As for the methods of study, to quote the author's own words "my general plan was to examine as many males of all ages as possible; to take a sample of blood from each; and at the same time to record the presence of certain physical signs. In doing this, standardised methods were employed, and the greatest care was taken to develop and retain a uniform technique."

Normals.—The previous studies by Bahr and O'Connor of the state of filarial incidence in the normal population were more of a qualitative than of a thorough nature. So a detailed study of the prevalence of the disease in males was undertaken and through the co-operation of the head men of the village, the District Officer and the native medical practitioner, valuable data were collected from the male population as "even in Samoa the women were less approachable than men and in the New Hebrides, where microfilaria is nocturnal, the pursuit of women at night may be dangerous as well as hopeless"!

In spite of the fact that the highest percentage examined was under 16 years of age, it is significant to note that up to the 15th year incidence among the population is comparatively low, and the author observes that the microfilaria is not found in early childhood in those parts of Oceania which have been studied and discusses the importance of these figures in the light of conflicting records obtained in other parts of the tropics. After a brief description of the physical signs of manifestation, co-efficients of correlation are worked out for several interesting features which are finally followed by a narration of the microfilarial count.

Pathological Conditions.—In his introductory note in the chapter on pathological conditions the author observes "we accumulated a relatively large mass of facts about certain aspects of filariasis and I think that our observations contribute to the solution of the problems of that disease. I therefore feel compelled to tabulate and publish these data. I shall confine myself to these aspects of the disease on which I have something new to say."

"Myositis," "Hydroceles," "Elephantiasis," and "Other Clinical Observations" are the broad divisions into which the pathological conditions are divided, and under each information such as incidence, clinical facts, pathological notes, causes, etc., are discussed on copious data. From the material collected, the author is inclined to the view that myositis in Oceania is a separate disease and that it is not a sequela of filarial infection; that in hydroceles traumatic cases do not fall in a class by themselves and that they ought to be regarded as filarial cases with an added element of trauma; that in elephantiasis, though *filaria* is an essential antecedent, its exact relation to elephantiasis is not known; and that it seems certain that nephritis is not a sequel of filariasis in Samoa. A detailed discussion of this very interesting chapter will be out of proportion to the scope of this review, but we shall content ourselves by drawing the special attention of the workers on the subject to the various original views—views based on observed facts—placed before the reader.

The chapter on Filariasis in Oceania is a clear analysis of the state of prevalence of the disease and its distribution. In a four-page summary the results of the observation are all beautifully epitomised.

Part VI of the book is devoted to a very brief survey of the distribution of diseases other than filariasis for example yaws and syphilis, tuberculosis, enteritis and dysentery, gonorrhœa, leprosy, tetanus, exanthemata, diseases of the eye, intestinal helminthiasis, neoplasms, spleen rate and abnormalities; and the last chapter on "Brown man and White" in Samoa, in which the author compares in a charming style "this picture and that," namely, the inhabitants before and after the introduction of western civilisation, is more or less of anthropological interest.

The memoir forms a valuable addition to the study of diseases in the tropics and deserves the serious attention of workers interested in tropical diseases. We welcome its publication and warmly commend it to our readers.

S. S. R.

TAKING THE DOCTOR'S PULSE, AND ANOTHER ESSAY.—By J. F. Montague, M.B., F.A.C.S., Philadelphia and London: J. B. Lippincott Company, 1928. Pp. 103. For private distribution. Nominal Price $1.00.

THE object of the two essays contained in this book is to advocate a more extended use of the cinematograph film in medical education. That the motion picture can play an important rôle not only in the education of the medical man (or potential medical man), but also in the instruction of the non-medical public, is unquestioned; indeed it has already been co-opted as a valuable ally in the realms of embryology, pathology (especially in connection with tissue-culture work), and, most of all, public health propaganda. But when Dr. Montague suggests that practical work in anatomy and in physiology should be replaced by cinema demonstrations of these subjects we cannot agree. The medical curriculum in these days is hopelessly overcrowded, and the author's plea for a shortening of the time devoted to fundamentals and the utilisation of the time thus saved to work in the hospital ward and out-patient department will meet with unqualified approval, but medicine is essentially a practical subject and any saving of time should not be effected at the expense of practical work at any stage of the curriculum.

The suggestion that the cinema-camera might be profitably employed in the operating theatre is worth consideration. We feel certain, however, that there are some surgeons—lamentably deficient "forward-lookers" no doubt—who would pugnaciously resent the suggestion that their activities in the holy of holies should be to some extent controlled by a camera-man, complete with eye-shade, horn-rims and possibly megaphone, and suspended Icarus-like above the field of operation. The purist might find scope for criticism of the author's style. "Thru" and "thoro" are strange to English eyes but they are doubtless good American, "obligated" is common in legal phraseology, but not in every-day speech—at least in English-speaking countries, "to *we* of the medical profession" is wrong—on both sides of the Atlantic, "ther" for "their" (p. 28) is probably a printing error, while "listening to the ballyhoo of an operator" is, one gathers, distasteful to Dr. Montague, and also, let it be said, to the reviewer.

At one point the author shoots off at an amazing tangent with the suggestion that men of mark in other spheres of activity, instead of retiring from active work at 50 or 60 "should transplant the intellect which has made them industrial giants to the field of medical research." Is it possible that the author does not know his Osler?

The major criticism that we have to offer does not concern the two essays themselves, but the remainder of the book. The essays mentioned occupy a total of 44 out of 103 pages; the remaining 59 pages are devoted to brief synopses of three other books by the same author complete with prefaces, tables of contents, and extracts from the reviews of various British and American journals. This practice—undoubtedly borrowed from the picture theatre—is uncommon in medical books and, in our opinion, should not be widely imitated.

The price, though "normal," presumably has to be paid in hard cash, and we feet that the reading of Dr. Montague's essay at the rate of an anna a page is a luxury that few of the medical practitioners of India can afford.

CLINICAL OBSERVATIONS ON INFANT FEEDING AND NUTRITION.—By H. B. Gladstone, M.D. (Edin.). London: William Heinemann (Medical Books) Ltd. 1928. Pp. XII plus 118. Price 7s. 6d. net.

GLADSTONE'S "Clinical Observations on Infant Feeding and Nutrition" is written by a general practitioner

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

RADIO-MALT

The Unique Vitamin Tonic containing Vitamins A B & D

RADIO-MALT is definitely anti-infective; a fact which is of special importance to all physicians everywhere. Radio-Malt possesses antirachitic, antineuritic and growth-promoting properties; it promotes normal dentition in the young and checks dental caries in the old and young alike; also it is definitely tonic in its action. To the expecting and nursing mother, to the anæmic and to the convalescent recovering from severe illness Radio-Malt is invaluable.

Radio-Malt is prepared and standardised by scientific methods which are recognised as sound. Being accurately standardised—also more concentrated and therefore more intense in its effects—it is more reliable than cod-liver oil and malt, which it definitely supersedes.

There is no effective substitute for Radio-Malt.

In no part of its manufacture is Radio-Malt touched by the hand.

Stocks of Radio-Malt are held by

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA,

BYRAM MISTRY,
Graham's Bdgs., Parsee Bazar St.,
FORT, BOMBAY,

who will be pleased to attend to the requirements of physicians at all times.

THE BRITISH DRUG HOUSES LTD.
LONDON

Vit.Pr./In/2! 3

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"NORMACOL" BRAND.
TRADE MARK

Intestinal Evacuant.

"Sweeps the bowel clean"

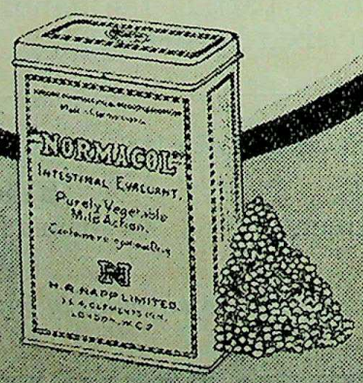
PAINLESS. HARMLESS.
MECHANICAL IN ACTION.
NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

A PURE VEGETABLE PRODUCT.
Containing NO Agar-Agar,
Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co. Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H.R.NAPP LIMITED,
3 & 4, Clements Inn, London, W.C.2.
Telegrams: "NAPPCHEM LONDON" Telephone: HOLBORN 1144 (Twelve lines)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

for general practitioners, welfare workers, nurses and mothers. It is well written and the teaching is sound and well considered. No special line of feeding is recommended: the dried milks are given a high place, after breast milk, in the first three months of infant life. The composition and methods of preparing the various foods are fully described.

The difficulties and disorders of infant feeding are superficially dealt with and the remedies indicated. There is a good account of the vitamins, and some pages are devoted to actinotherapy.

One or two statements are vague and without proof, e.g., "The element of freshness is necessary to stimulate normal digestion and metabolism." One wonders what is the "element of freshness" apart from the vitamine content. Maltose or dextrimaltose is said to be the most quickly absorbed of all carbohydrates: what is the proof of this?

The book is excellently printed. Although there are other and better books on the subject, the author is to be congratulated on his work which can be recommended to those for whom it is intended.

S. A. McS.

IDEAL MARRIAGE: ITS PHYSIOLOGY AND TECHNIQUE.—By Th. H. van de Velde, M.D. Translated by Stella Browne. London: William Heinemann (Medical Books) Ltd. 1928. 323 pp. with 8 colour plates and 4 graphs. Price 25s. net.

THIS is not an easy book to review. A generation ago the medical practitioner knew little or nothing of "sexology", it was not included in his medical curriculum and the reviewer can speak from personal experience, as a civil surgeon in India, of the embarrassment which he felt when consulted on such intimate details by young married couples. To-day, the circle has turned full wheel, and books dealing with birth control and contraceptives are so common-place that they tend to become rather boring.

The volume under review, however, is something entirely different. In the introduction by Dr. J. Johnston Abraham, C.B.E., D.S.O., M.D., the latter writer states that "this is the book on the physical problems of marriage we have all been waiting for. It had to be written; and written exactly in this way—soberly, scientifically, completely, without a scintilla of eroticism, and yet with a sustained note of high idealism..... In this book will be found all the data bearing upon the physiology and technique of sexual congress, clearly stated, without pruriency or mock modesty—in other words, scientifically." With this summary we are in complete accord. The author is a man of fifty years of age, for many years formerly Director of the Gynæcological Clinic at Haarlem, and the author of many papers and publications in obstetrics, gynæcology, and bacteriology. The very difficult subject treated is handled scientifically, without eroticism, and yet in very plain terms.

The book is divided into four parts. Part I deals with the general physiology of sex. Here there are fully considered marriage as it is—actual and ideal: the stimuli involved in sex impulses—both direct and indirect; and the rôle of the associated senses in arousing sexual impulses. Part II deals with the anatomy and physiology of sex, is illustrated by the colour plates at the end of the volume, and covers ground more or less familiar in such works.

Part III, however, is that which differs so fundamentally from the treatment of the subject in other books which deal with it. Here we have very fully stated in plain terms, but in strictly scientific language, the entire technique of sexual intercourse, from the erotic kiss to the final orgasm. It is this part of the book that may well arouse criticism; yet we believe that the author has a very definite purpose to fulfil and that the sexual lore imparted in these pages will appeal to two classes of readers—the medical man who may often be consulted upon the subject, and who is often very ignorant of it; and the recently married husband, whose ignorance is still more profound. Writing as a married man of more than twenty years' standing, the reviewer considers that this part of the book would help innumerable couples to make marriage a much happier business than it is wont to be. The author is emphatic on one aspect of marriage; the bride must be wooed as much and even more after marriage than before; the sexual impulses generated in the female partner must be gratified, and only when the husband has educated his partner fully is sexual intercourse fruitful, and desired, and not resisted by the wife.

That this is true is a fact which almost every member of the medical profession probably knows from personal experience of the practice of his profession. The crude bachelor's idea that the nuptial night is an orgy of indulgence on the part of the husband, and the honeymoon a prolongation of eroticism on the part of the male partner, is nonsense, as every married man should know. There is no period of married life when more consideration and more inhibition is called for; the female partner must be educated, taught, considered—at every step. And Dr. van de Velde's writing is plain speaking itself. He describes the preliminaries to sexual intercourse very fully, and details eleven positions for coitus, with a table to show the different types of persons of both sexes to which they are applicable. Graphs are given which present in graphic form the sensations of both partners in different types of intercourse. In common with most medical experience he condemns "coitus interruptus" unreservedly; it leaves the female partner with her erotic impulses fully aroused but ungratified, and with resulting pelvic congestion lasting for hours after the act. Even the after-effects of coitus are considered.

In Part IV, the bodily, psychic, emotional and mental hygiene of intercourse are considered; and again the advice given is sane, sound, and practical. A feature of the book is its "intermezzos" of aphorisms—ancient and modern—with regard to the art of love; there is here much that is both witty and apposite.

Present-day marriage is an utterly blind business. The two partners suddenly drive into it with little or no pre-knowledge, or premeditation. The result is too often the sequel of repulsion on the part of the wife, unfaithfulness on the part of one or both partners, mutual dissatisfaction, and—finally—the divorce court. Dr. van de Velde's main thesis is that this is preventable; but it is necessary that the husband should realise that "marriage is a science," that the female partner has to be initiated and educated in the fullest senses of the terms, with the utmost consideration and care. That thesis we believe to be a very true one, but it is by no means as yet universally realised. The medical man is not infrequently consulted by patients of both sexes with regard to such intimate matters, and—in the terms of Dr. Johnston Abraham, who writes the introduction—we believe that "this is a book that should be in the library of every doctor, who looks upon his patients not as 'cases,' but as human, very human beings entrusted to his care."

APPENDICITIS.—By H. A. Royster, A.B., M.D. New York and London: D. Appleton and Co. 1927. Pp. 370 with two coloured plates and 56 figures in the text. Price 21s. Available from Messrs. Butterworth and Co., Calcutta. Price Rs. 15-12.

APPENDICITIS is such a common disease in the general practitioner's work that any monograph which will further its scientific understanding will always be appreciated in spite of the many books, articles and journals that have already been written on the subject.

The author has reviewed the important papers dealing with inflammation of the appendix for the last 5 years and has given his own views and the opinions of others on our present knowledge concerning appendicitis The monograph opens with "last words" on appendicitis by such giants in the art of surgery as Murphy, Octsner, Deaver, and Mayo. Chapter I, deals with an historical sketch of the disease. It is of interest to know that anatomically the appendix has been known since the 16th century, pathologically recognised in the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

18th century and clinically is the product of the 19th century. Special chapters are devoted to the anatomy, physiology, etiology, pathology, symptomatology, diagnosis, complications and prognosis. They are discussed in great detail and in a clear, convincing style. The paragraph on diet as a causation is most interesting. That diet plays a large part in the disease is well-known and accounts for the lower incidence among Indians.

Rolled millet flour is supposed to be a cause of the increased frequency of appendicitis amongst the highly civilized nations. On the other hand, other authors attribute it to an excess of meat and fat in the diet.

A special chapter is devoted to appendicitis in children and the author emphatically states that the only treatment for this ailment in children is surgical—no matter in which stage the patient is seen. The chapter on treatment is excellent. Early diagnosis, early operation by a competent surgeon, avoidance of purgatives and morphia are the essentials that diminish the death rate in appendicitis.

The author quotes Rutherford Morrison who says: "There would be no percentage of deaths from appendicitis if every case commencing with acute pain, developing tenderness and rigidity of the abdomen and quickening of the pulse were operated upon within 12 hours."

The author advises the McBurney or grid-iron incision in acute cases, but advocates the Battle incision for all chronic cases in which it is necessary to explore or operate upon the upper abdomen or pelvis. In England the tendency is nowadays to give up the Battle incision and replace it by the paramedian incision for less obvious cases where inspection of the abdominal contents may be required.

The monograph is well brought out; the illustrations are good; it is a book which will be read with great interest by the general practitioner as well as the surgeon and we strongly recommend it as a useful addition to any medical library.

E. O. G. K.

Annual Reports.

REPORT ON THE WORKING OF THE PUNJAB MENTAL HOSPITAL, LAHORE, FOR THE YEAR 1927. GOVERNMENT PRINTING PRESS, PUNJAB. PRICE RE. 1-1.

SEVERAL features of interest are recorded in the Punjab Mental Hospital Report for 1927.

Admissions, Discharges, Etc.—1. *Population.*—The number of patients remaining under treatment on the 1st January, 1927, was males 665 and females 182, making a total of 847. During the year 397 patients, of whom 317 were males and 80 females (the figures include re-admissions, and cases sent for observation; some of the latter were discharged without certification) were admitted to the hospital. The total number of patients treated thus amounted to 1,244, being 94 in excess of those treated in 1926.

The average population for the year was 889.88, as compared with 854.19 in the preceding year. The population rose very rapidly during the latter half of the year and on 25th November, 1927, there were no less than 956 patients under treatment. The maximum number of patients under treatment in 1926 was 884.

The total number discharged was 218, as compared with 224 in 1926, of whom 132 were discharged as cured, 58 as improved, 6 not improved and 22 otherwise.

The percentage of cures to the daily average strength was 14.48 as compared with 11.47 in 1926.

2. *Sickness and mortality.*—The death rate expressed as a percentage of the average strength was 11.45 as compared with 9.25 in 1926 and 14.23 in 1925. Out of 102 deaths, influenza and pneumonia each accounted for 19. During the year 55 patients were treated for pneumonia with 19 deaths and 81 for tuberculosis of various forms with 15 deaths. Bowel diseases such as dysentery, diarrhœa, colitis and enteritis accounted for 86 admissions to the hospital with 9 deaths. There were 11 deaths from epilepsy and status epilepticus.

3. *Criminal Patients.*—There was an increase of 20 in the number of patients treated during the year under review. No less than 53 criminals were admitted, making a total of 207 patients under treatment. There were 164 criminals in the institution at the close of the year.

4. *Accommodation, New Buildings, Etc.*—The new hospital section on the female side has not yet been completely taken over, as the head of water was insufficient for the water carriage system, which has been installed. A new tube well has been sunk in order to remedy this defect.

The report of Major Lodge-Patch, Superintendent of the Hospital and Mr. Ram Chandra, I.C.S., who were deputed by the Punjab Government (Ministry of Local Self-Government) to visit mental hospitals in other provinces was received during the year and is under the consideration of Government.

The so-called "Hospital Section" is not suited for the treatment of patients; and the Superintendent has made proposals for remodelling the buildings so as to make them suitable for modern methods of treatment of mental patients.

Reference has been made in the previous paragraph to the water carriage system which has been installed in the Female Mental Hospital and is working satisfactorily; the nuisance of insanitary open drains has been abolished, and it is hoped that a similar system of sanitation will be introduced on the male side in due course.

The sanitary condition of the Mental Hospital will continue to be unsatisfactory until the Mian Mir Storm Water Channel is prevented from being a breeding ground of mosquitoes. The Director of Public Health has been asked to recommend measures for dealing with this menace to the health of the patients in the hospital and other inhabitants of the neighbourhood.

During 1927, there were no deaths by violence; and no fatal accidents. There were 3 escapes during the year under report but all the patients were recovered.

As in previous years, the manic-depressive psychoses account for the greatest number of admissions—no less than 199 out of a total of 397. Seventy-one cases of insanity due to cannabis indica during the year were admitted and 29 cases of dementia præcox.

The Superintendent, Major C. J. Lodge-Patch, M.C., I.M.S., is making every effort to bring the hospital into line with the high standards now prevailing in similar institutions in Western countries.

ANNUAL REPORT OF THE PUBLIC HEALTH COMMISSIONER WITH THE GOVERNMENT OF INDIA, FOR 1926, VOL. I, WITH APPENDICES. CALCUTTA: GOVERNMENT OF INDIA, CENTRAL PUBLICATION BRANCH, 1928. PRICE RS. 2-4, OR 4s. NET.

INTRODUCTION.

THE Annual Report of the Public Health Commissioner with the Government of India for 1926 has just come to hand. The very brief synopsis given below is extracted from Vol. I of the report which deals with the "Civil" Health: Vol. II is devoted to the Health of the Army in India.—(EDITOR, *I. M. G.*)

On the State of the Public Health in British India.

The defects in the system of registration and compilation of vital statistics in India have been commented on *ad nauseam* in previous reports; but it has also been shown that, provided their limitations are intelligently borne in mind, these vital statistics provide a fairly reliable groundwork of fact on which public health policy may be founded. It need hardly be reiterated that a report such as this, condensing as it

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Oral Sepsis

The term Oral Sepsis was introduced by Dr. William Hunter in 1900 and sponsored by Sir Thomas Barlow in his recognition of it as the greatest septic infection in medicine. As the years passed a growing circle of believers joined in appreciation of Dr. Hunter's work and nomenclature, and in 1910 Dr. Mitchell Bruce in his presidential address said:

> "Its effects are so widespread, so multiple, and frequently so grave as to make us ashamed of our previous blindness to a common source of blood infection staring us in the face all these years."

In view of the world-wide interest now taken in oral sepsis, the following extract from a letter, recently received by the proprietors of Dimol from a distinguished Fellow of The Royal College of Surgeons, should make a strong appeal to all Medical and Dental Practitioners.

> "I have been using Dimol (tablets) and there is no doubt whatever that it is the very thing I have been trying many years to obtain, in order to settle a point which I have been considering for a long time.
>
> "I believe it is generally assumed that the organisms which are responsible for Dental Caries and Pyorrhœa find their way to the intestine, and there set up putrefaction and fermentation, which cause the common symptoms of mal-digestion, and subsequent toxæmia (lassitude, headache, etc.). There seems to me another possible theory, viz., that Pyorrhœa is a *blood infection*, and that this infection may be directly attributable to a bacterial disturbance in the intestinal tract. I am inclined to this view because during a long career I have come across so many young people suffering from the intestinal symptoms first, and *then* getting Caries and Pyorrhœa.
>
> "I am personally most grateful for Dimol."
>
> ———, F.R.C.S. (Eng.).

The efficiency of Dimol in the treatment of putrefactive and other bacterial invasions of the intestinal tract is conclusively told in the interesting clinical reports which, together with a brochure dealing with the pathological significance of the intestinal toxæmias, will be sent to any medical or dental practitioner on request.

Dimol Laboratories, Ltd., 40, Ludgate Hill, London, E.C.4.

Dimol may now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUINING TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

***Vide* Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.**

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

does the available information of the health of a sub-continent, is not an exhaustive guide to the student, who should refer to the detailed reports of provinces and municipalities.

The chief statistical facts, relating to the public health in British India in 1926, are now set out:—

(1) the birth rate rose from 33.65 per mille in 1925 to 34.77 per mille in 1926;

(2) the death rate rose from 24.72 in 1925 to 26.76 in 1926;

(3) the infantile death rate rose from 174 in 1925 to 189 in 1926.

POPULATION.

The population of British India within the registered areas has been stated in decennial periods and age-groups in the following two tables which are compiled from the provincial public health reports.

A.—*Population under registration.*

Year.	Population for British India (under registration).
1872	180,508,677
1881	184,998,433
1891	206,608,713
1901	224,280,118
1911	238,688,119
1921	241,419,723
1922	241,419,723
1923	241,469.026
1924	241,469,026
1925	241,469.026
1926	241,471,383

B.—*Population under registration by sex and age. (The figures against age-groups exclude Delhi and Ajmer-Merwara for which figures are not available.)*

Age-groups.	Males.	Females.	Persons.
All ages	123,944,888	117 526,495	241,471.384
0–5 years	14,849,405	15,376,806	30,226.211
5–10 ,,	18,248,639	17,477,030	35,725,669
10–15 ,,	15,355,643	12,529,322	2[illegible],884,965
15–20 ,,	10,512,220	9,718,892	20,231,112
20–30 ,,	20,413,565	20,944,963	41,358 528
30–40 ,,	18,029,771	16,377,084	34,426 855
40–50 ,,	12,539,172	11,316,364	23,855,536
30–60 ,,	7 619 020	7,118,253	14,737,273
60 and upwards	0,283,478	6 569,357	12,846 835

Estimated population for the year 1926 is available for Central Provinces, Madras and the Punjab, the figures being 14,509,867 (an increase of 597,107 over the census figures), 45,102,311 (43,307,590 according to previous intercensal increases) and 21,538,849 (an increase of 1,021,243 over the census figures), respectively.

RAINFALL AND OTHER WEATHER CONDITIONS.

Through the courtesy of the Director-General of Observatories, the details of the chief features of the rainfall and other weather conditions during 1926 are appended.

Taking the year as a whole rainfall averaged six per cent. above normal. The greatest defect—25 per cent.—occurred in Hyderabad South; excesses of 21 per cent. or more were recorded in the Bay Islands, Upper Burma, the North-West Frontier Province, Sind, Rajputana, Gujarat, Central India East and the Central Provinces West; in the remaining sub-divisions, rainfall was within 17 per cent. of the normal.

BIRTHS.

British India.—Births numbered 8,395,679 or 270,271 more than the figure for 1925, the birth rate being 34.77 against 33.65, in 1925 and 33.35, the mean of the previous five years. The increase was shared by all the provinces, except Delhi, Bengal, and Ajmer-Merwara, where the decrease was 0.61, 2.2 and 1.81, respectively. With the exception of Bengal, Coorg, Burma and Ajmer-Merwara, all provinces showed an increased birth-rate as compared with the quinquennial mean.

DEATHS.

British India.—Deaths numbered 6,460,610 as compared with 5,967,918, in the preceding year—an increase of 492,692. Registered births exceeded deaths by 1,935,069 against 2,157,490 in 1925; all the provinces with the exception of Delhi, Coorg and Ajmer-Merwara having contributed to this in the following order:—Madras (431,764), United Provinces (413,170), Bihar and Orissa (393,563), Bombay (162,871), Central Provinces (162,748), Bengal (125,183), Punjab (105,158), Burma (72,095), Assam (53,446) and North-West Frontier Provinces (18,036).

The death rate was 26.76 as against 24.72 in 1925 and a quinquennial mean of 26.53. The urban death rate was 32.49 against 29.65 and the rural rate was 26.21 against 24.30 in 1925. In Delhi and Assam, the rural rates exceeded the urban ones; in Coorg the urban rate exceeded the rural one by 45.78, in Burma by 18.63 and in United Provinces by 16.81.

STILL-BIRTHS.

These continue to be recorded over a very limited area in British India.

Bombay Presidency.—11,550 still-births or 1.63 for every 100 live-births, were registered as against 10,862 or 1.63 in 1925; while the following percentages of still-births to live-births show the range of variation:—Bombay City 8.07, Kanara district 5.16, Dharwar 3.21, Bijapur 3.01, Kolaba 2.77, Surat 2.76, Belgaum 2.37, Karachi 2.12, Bombay Suburban 2.04 and Ahmednagar 0.23 per cent. of live-births.

United Provinces.—13,948 still-births were recorded against 14,404 in 1925 and 15,610 in 1924, a steady decline; Gorakhpur district as usual heading the list with 3,249, ascribed to defective reporting. In many cases still-births are attributed to venereal disease; the question of creating an agency to deal with venereal disease was under the consideration of Government.

Burma.—There were 2,836 still-births in urban and rural areas (9.59 per mille of registered births). Amongst towns, Henzada (110.52), Pegu (100.47), Pakokku (97.60), Bassein (89.82), Moulmein (72.88) and Rangoon (67.00) returned high rates, whilst the rural areas recording high rates were Kyaukse (19.33), Sandoway (12.83), Mandalay (10.06), Amherst (9.93), Magwe (9.08) and Minbu (8.25).

Central Provinces.—13,786 still-births were recorded (13,146 in 1925). The Chhatisgarh and Berar districts returned the largest numbers. In some districts venereal disease was said to be responsible for most of the still-births.

Madras Presidency.—Still-births numbered 21,032 (11,447 males and 9,585 females).

In many rural areas and municipal towns instances of faulty registration were recorded, i.e., still-births were either not registered at all or were being included among both births and deaths.

Bengal Presidency.—59,571 still-births were reported (62,281 in 1925), showing an increase of 3.0 per cent. over 1925 in proportion to total births.

INFANT MORTALITY.

1,587,091 deaths or 24.6 per cent. of total mortality occurred during the first year of life against 1,416,983 and 23.7 per cent., respectively, in 1925. In England and Wales the corresponding figures for 1925 and 1926 were 11.3 per cent. and 10.7 per cent., respectively.

The infantile death rate calculated on the births recorded during the year was 189 as against 174 in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

1925 and 189 in 1924. Every province recorded an increase, except Coorg. In British India 749,086 (47.2 per cent.) of the infantile deaths occurred during the first month of life, against 702,571 (49.58 per cent.) in 1925. This equals 89 per 1,000 of live-births—a rate, again, in excess of the total infantile mortality rate in England and Wales, which was 70 per 1,000 births registered.

MATERNAL MORTALITY.

Bombay Presidency.—The number of women who died in child-birth increased from 3,502 in 1925 to 4,392 during 1926; while Bombay city registered 143 deaths (114 in 1925): in other words, in 1926 in the Presidency as a whole, one woman died in child-birth for every 162 live-births (1 in 190 in 1925). The urban and rural figures were one per 85 and 193, respectively, against 111 and 218 in the preceding year. Amongst the collectorates, the mortality from this cause was again greatest in Kanara where, for every 47 births, one mother is said to have died (1 in 46 in 1925). The towns in Sind continued to return inordinate rates, Larkana one maternal death in every 30 births, Shikarpur 1 in every 31 and Sukkur 1 in every 52.

Madras Presidency.—7,142 deaths from causes associated with child-birth were registered.

The Director of Public Health attributes this steady increase to better registration, but again points out that the extent of mortality from this cause is still very much underestimated.

Central Provinces and Berar.—3,391 deaths were recorded—579 in municipal towns and 2,812 in rural circles, as compared with 2,520 deaths in 1925—426 in municipal towns and 2,094 in rural circles. Most of these deaths are said to be due to interference by the untrained dais and also to want of proper care and treatment after delivery.

Bengal Presidency.—The registration of maternal deaths is said to be gradually improving. During the year, 3,228 deaths were recorded against 2,790 in 1925.

United Provinces.—1,817 deaths were reported—1,408 in 1925.

Burma.—401 deaths from child-birth were recorded in towns (339 in 1925)—or 11.18 per 1,000 registered births. The highest rates were returned in Pakokku (47.95), Akyab (26.41) and Tavoy (23.33).

Maternity and Child-Welfare Work.—A more detailed account of the various provincial activities on lines similar to those of last year follows. It depicts roughly the position arrived at in the various provinces.

Bengal Presidency.—The educational propaganda and publicity branch was increasing in popularity and utility. 312 lectures were delivered with magic lanterns and 50 bioscopic shows with departmental films were given. District boards, municipalities and other local institutions sought help of this branch. 50 sets of multi-coloured magic lantern slides on various preventible diseases were prepared and leaflets and pamphlets published and distributed. A new film on maternity and child-welfare was produced and was well received by the public.

During the year grants-in-aid for dai-training were made to the various local bodies for starting 100 training classes (of 10 dais each). A total of 1,094 dais received training in 101 classes, started by 32 local bodies and 3 health societies.

United Provinces.—The schemes for the improvement of indigenous dais and that for the training of probationers are reported to have made satisfactory progress. Baby week celebrations held under the United Provinces Branch of the All-India Maternity and Child-Welfare League during 1926, were carried out with success in 32 districts in the province. The Council of the League held one meeting during the year. The local Government increased their grant from Rs. 26,000 to Rs. 50,000 during the year. Of this, the provincial branch distributed Rs. 36,000 as donations to the branches already in existence and as a preliminary gift to other districts only to encourage them. At present maternity and child-welfare work is being carried out in 22 districts; 12 more are expected to start work in the near future. The Indian Red Cross Society (United Provinces) gave Rs. 500 for central expenses in connection with the baby weeks; the Council of the All-India Lady Chelmsford League, Delhi, also gave their usual grant of Rs. 3,000.

Burma.—The Burma branch of the Indian Red Cross Society made grants, aggregating to Rs. 2,904, to various infant welfare societies from the Child-Welfare Endowment Fund. The number of societies now affiliated is twelve.

Madras Presidency.—In municipal areas 406 (343 in 1925), trained midwives attended 36,564 births; in rural areas 542 (497 in 1925), midwives attended 45,300 births. The number of maternity relief and child-welfare centres, which had increased from 23 in 1923 to 58 in 1925, decreased to 53 in 1926; this is deplorable.

Central Provinces.—A special welfare committee of the Red Cross Society was constituted for organising and expanding maternity and infant welfare work. The local Government made a grant of Rs. 20,000 for the purpose. Up to the end of December, 1926, 13 centres were sanctioned. Great difficulty was experienced in securing trained health workers and dais. Centres were also opened at Wardha and Burhanpur and more will be opened at Seoni and Khamgaon. The Red Cross gave Rs. 1,800 for a centre in Jubbulpore during 1927. Nagpur possesses 5 centres, 3 managed by the municipality, one by the Red Cross Society, and one by the provincial welfare committee in connection with the health school.

Regular informal clinics were held for mothers where they were taught mothercraft, sewing and principles of hygiene and feeding. In two of the infant welfare centres managed by the municipality, dais were trained.

Bombay Presidency.—The ten sanitary associations continued their useful work. That at Karachi conducted 1,059 maternity cases (894 in 1925) and organised a "baby and health week." There were 7 midwives in charge of different quarters. The lady health visitors paid 3,485 house-to-house visits. In the Bherumal Thakurdas maternity home, a gynæcological department was introduced; 361 labour cases were conducted and 850 cases of gynæcological operations were performed; out of the 24 cases of premature birth conducted 18 died. The training of native dais in maternity was ably carried out at Hyderabad, and was extended to seven centres; 55 dais were under instruction, and 192 were under supervision; 326 midwifery cases were superintended. The association at Shikarpur delivered ten public lectures and distributed leaflets and pamphlets. That at Broach delivered 32 lectures in the city and 25 in the district with magic lanterns; a health show was also held; 10,000 quinine tablets were distributed free and 20,000 sold in rural areas and the city; leaflets on consumption, child-welfare, malaria and fly nuisance were also distributed free. The pure milk supply branch of this association distributed at cost price 3,408 maunds and 2 seers of milk to the public at three centres. The Ahmedabad association organised 52 magic lantern lectures. Other associations also worked according to local requirements and opportunities. The "health and baby week" movement was celebrated in many important towns. The Assistant Director of Public Health, though unable to attend personally at these health shows, co-operated with the local organisers in their inauguration and management.

Punjab.—The Punjab health school which trains lady health visitors for the province was continued during the year as a private concern, conducted and financed by the Lady Chelmsford League (Punjab Branch). The Government has, however, agreed to provincialise this school which has accordingly been taken over by the public health department with effect from 1st April, 1927. 8 students were admitted to the school, and all of them passed. 16 local bodies were by the end of the year employing lady health visitors and most of them had opened maternity and child-welfare centres; those at Simla and Gurgaon are quoted as instances of excellent work. The question of subsiding this movement was under discussion with Government.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Arthigon

Schering

Anti-gonococcal vaccine polivalent and retaining its efficacy for an unlimited time

Indications

Gonococcal complications, prostatitis, epididymitis, adnexia, arthritis, gonococcal rheumatism.

Arthigon is an emulsion of gonococci in a solution of Urotropin, which latter guarantees its perfect stability even in hot countries. The emulsion is an association of the stimulant specific of the gonococci with the omnicellular specific of Urotropin.

Samples and literature on application to:

SCHERING-KAHLBAUM (INDIA), LTD.

Telephone: Cal. 4770
Telegrams: Aeskulap

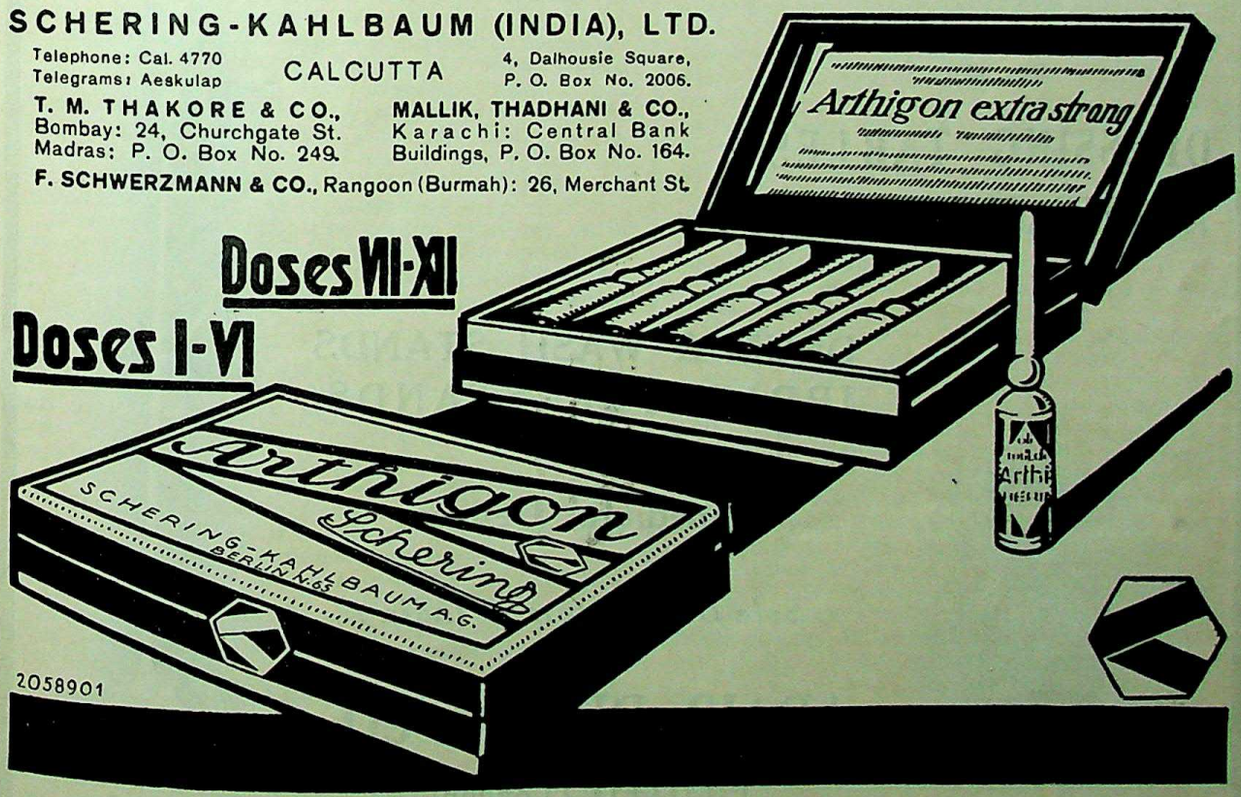
CALCUTTA

4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

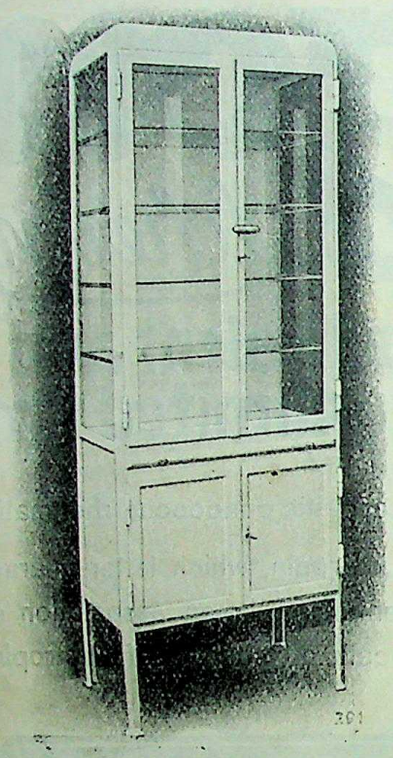
F. SCHWERZMANN & CO., Rangoon (Burmah): 26, Merchant St.



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

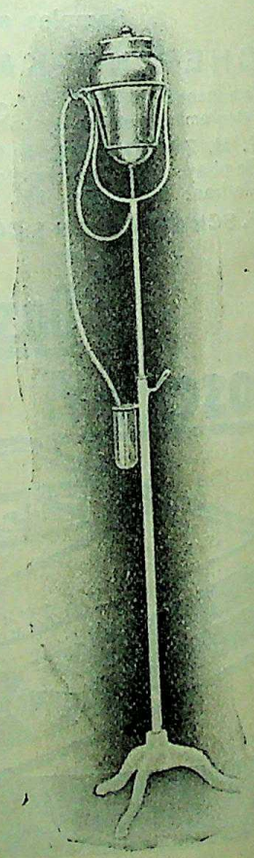
MAQUET :::



Rs. 230|-

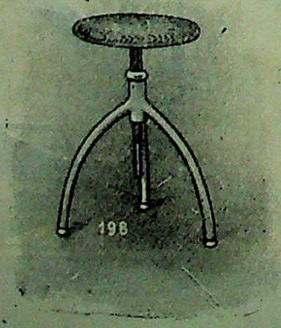
INSTRUMENT CABINETS
OPERATION TABLES
EXAMINATION CHAIRS

DRESSING TABLES
ADJUSTABLE STOOLS



DRUM & WASH STANDS
IRRIGATOR STANDS,
Etc., Etc.

Immediate Delivery



Rs. 25|-
Exchange Building,
Ballard Estate,
BOMBAY

Sole Distributors in India :

ADAIR, DUTT & CO.,

LIMITED (London),

5, Dalhousie Square, E.

CALCUTTA.

Rs. 60|-
Kaleeli Mansion,
Mount Road,
MADRAS

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Assam.—A child-welfare centre, instruction is given to mothers, has been opened in Shillong. In other towns "baby week" was held. Magic lantern demonstrations and lectures on child-welfare are given regularly by medical officers during the course of their visits to villages.

Bihar and Orissa.—Maternity and child-welfare work is in its infancy in this province, but the problem is being tackled. As a result of the movement inaugurated in India by Lady Reading, a Council has been formed and funds raised. In Patna, a start has been made by opening two centres under a maternity supervisor; in Cuttack a centre has been opened and here definite results are evident. It is estimated that one half of the births in this town were supervised by the workers; another centre has been opened at Balasore and another was under contemplation at Darbhanga. Up to the end of 1926, 488 dais were trained in methods of cleanliness during labour.

MALARIA.

Punjab.—The annual forecast issued by the public health department predicted with remarkable accuracy the distribution and intensity of malaria epidemic in the province. The unhealthiest month in respect of fever mortality, as is usual in years when malaria assumes epidemic form, was the month of October when 58,076 fever deaths were registered (43,659 in 1925). The districts showing the highest death rate were those affected by the malaria epidemic.

United Provinces.—749,868 malaria deaths were recorded. Bulandshahr, Meerut, Saharanpur, Moradabad and Bijnor districts showed the highest fever mortality, and Fatehpur, Ballia, Jaunpur, Allahabad and Ghazipur the lowest.

Bihar and Orissa.—Heavy floods in September in Orissa resulted in an increase of malaria cases. A spleen census of children was being taken. The figures so far obtained give a high percentage of enlarged spleens and indicate a very high incidence of malaria in most districts.

Bengal.—Fever death rate was highest in November and lowest in July. 458,208 deaths from malaria (ratio 9.8 per mille) were reported. Malaria was responsible for 55.7 per cent. of the fever mortality and 39.8 per cent. of the total mortality. For an analysis of the incidence of fevers and malaria by divisions and districts, and towns and rural areas, the provincial report should be consulted.

Assam.—A decreased fever death rate was again recorded—chiefly attributable to an actual decrease in the prevalence of kala-azar. The fever death rate was the highest in Goalpara district and the lowest in Sibsagar.

Madras Presidency.—The fever death rate per mille of population was 8.3 against 7.7 in 1925. The Director of Public Health thinks that a very large proportion of fever deaths is certainly due to malaria and urges for anti-malarial work and the permanent employment of a large anti-malarial staff.

Bombay Presidency.—The death rate from malaria for the Presidency as a whole was 2.83, while exclusive of Sind the rate was 1.18 only. Sukkur in Sind was the district of greatest severity with a rural death rate (malarial) of 15.13, followed by Thar and Parker with a rate of 14.50, Nawabshah 12.62, Hyderabad 11.34, Larkana 11.04, Upper Sind Frontier 10.81 and Karachi 9.18—due to excessive flooding and heavy rainfall.

Central Provinces.—All the districts participated in the increase in fever mortality (252,609 deaths against 204,667 in 1925). October and February were the months of the highest and lowest mortality, respectively. A scheme for a malaria bureau or field unit (for malarial surveys) was submitted to Government.

RELAPSING FEVER.

Punjab.—The disease was detected in 6 districts but it did not assume epidemic proportions. 304 cases and 143 deaths were recorded against 922 cases and 196 deaths in 1925. The case mortality was 47 per cent. (21 in 1925). The districts affected were Attock, Multan, Muzaffargarh and Dera Ghazi Khan.

United Provinces.—716 deaths were recorded though the district medical officers of health reported no epidemics of the disease in any of the districts.

Madras Presidency.—Mild outbreaks were reported from Coimbatore, Trichinopoly, Madura, the Nilgiris, Nellore, and Kurnool districts. The Kurnool district registered 295 cases and 56 deaths, Trichinopoly 84 cases and 34 deaths, Madura 29 and 7 and Nellore 27 and 7.

Central Provinces.—No outbreak of the disease occurred anywhere. Two mission hospitals in Mandla district treated ten cases though no confirmatory evidence was available. Khandwa and Jubbulpore treated one case each.

Bengal Presidency.—Relapsing fever was responsible for 0.04 per cent. of fever mortality and caused 3,075 deaths (0.07 per mille) as compared with 3,161 deaths (0.07 per mille) in 1925 and 6,798 deaths (0.14 per mille) in 1921. Calcutta has reported no cases of relapsing fever during the last three years.

KALA-AZAR.

United Provinces.—151 deaths (95 in 1925) were recorded. The local Government contributed Rs. 3,000 in connection with the Commission appointed by the Government of India in 1924 to inquire into the origin and progress of kala-azar and the measures necessary to combat it.

Assam.—4,176 deaths (6,365 in 1925, 5,585 in 1924, 4,131 in 1923 and 2,292 in 1922) occurred. 49,385 cases were treated (60,940 in 1925). The fall in deaths and cases both indicate that the disease is now under control and its further spread has been arrested. The percentage of deaths to the total treated was 8.48 (10.44 in 1925). The treatment is said to be growing in popularity and the number of cases stopping treatment before completion fell by 1,212. Special kala-azar hospitals have been opened in heavily infected areas. Hospitals and dispensaries with their out-centres treating kala-azar in the province numbered 415. The surveys which have been strenuously carried out in the villages have revealed the fact that fewer cases are being discovered in the earlier stages of the disease. Research work was being carried out in the kala-azar research wards of the Pasteur Institute and Medical Research Institute at Shillong with certain organic aromatic compounds of antimony. The question of using urea stibamine for all kala-azar cases was under consideration.

Bombay Presidency.—Two deaths were recorded in Bombay City.

Central Provinces.—Cases were reported from Raipur (3 cases) and Bhandara (1 case).

Bengal Presidency.—14,275 deaths (16,766 in 1925) were recorded, the rate per mille being 0.31 (0.36 in 1925). Kala-azar accounted for 1.7 per cent. of fever and 1.2 per cent. of total mortality. Kala-azar treatment centres have been opened in districts. The Central Co-operative Anti-malarial Society and the Bengal Health Association received grants from provincial revenues for the treatment of kala-azar cases. The former worked in 48 centres but for want of cases 10 had to be closed. A total of 1,327 new kala-azar cases were admitted to these centres. The latter with its 41 kala-azar centres treated 4,731 cases.

INFLUENZA.

Bombay Presidency.—As compared with the previous year, the mortality from influenza rose slightly (i.e., 362 against 192 in 1925).

Central Provinces.—The disease prevailed in a mild form, the number of cases treated being Bhandara 325; Jubbulpore 2,214; Saugor 625, with 10 deaths; Damoh 596; Seoni 826; Mandla 430, with 3 deaths; Hoshangabad 140; Raipur 613; Amraoti 4,151 and Yeotmal 1,116. Mild cases occurred in Buldana also.

Bengal Presidency.—Influenza accounted for 1,817 deaths—0.03 per mille against 1,901 deaths in 1925—0.04 per mille.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Punjab.—433 cases and 52 deaths were recorded. The deaths were distributed as follows:—Kangra 26, Muzaffargarh 21 and Sialkot 5.

In Amritsar and Dera Ghazi Khan districts also the disease prevailed to some extent.

United Provinces.—Sporadic cases occurred in some districts.

Burma.—79 deaths were recorded in towns.

ENTERIC FEVER.

Bombay Presidency.—The accuracy of death figures especially in rural areas is not to be relied upon. 124 deaths were recorded in Bombay City (139 in 1925), 1,265 in Southern Registration district, 511 in Central, 342 in Sind, 31 in Guzerat and 3 in Western Registration districts.

Punjab.—6 cases with no death were registered in Simla town (49 cases with 7 deaths in 1925).

Central Provinces.—111 cases of enteric fever were treated in Jubbulpore, 38 in Raipur and 16 in Bhandara. The civil surgeon, Jubbulpore, remarks that the diagnosis of out-patients was doubtful.

United Provinces.—10,266 deaths were recorded.

Bengal Presidency.—The enteric deaths fell from 7,752 in 1925 to 5,368 in 1926, the death rate being 0.11 per mille (0.17 in 1925). 71 towns out of 116 did not report a single death from this cause.

Burma.—348 deaths occurred in towns. Pyapon returned the highest ratio. The disease continued in Mandalay throughout the year.

BERI-BERI.

Bengal Presidency.—Cases of epidemic dropsy were noticed in the towns of Hooghly and Chinsura and in some villages in Burdwan, Howrah, Faridpur and 24-Parganas districts. In Khulna district an outbreak of the disease was reported both in towns and rural areas. In Bakarganj district 251 cases with 13 deaths of epidemic dropsy were detected.

Central Provinces.—Raipur recorded one case of beri-beri.

Madras Presidency.—In Ganjam district epidemic dropsy appears to break out in an epidemic form at the same time (April and May) each year and subsides with the advent of the rains. 102 cases were discovered and in 88 of these, the infection was traced to two endemic foci in the union village. The death rate was 6 per cent. The disease is said to be gradually assuming larger proportions and a further investigation is called for.

RESPIRATORY DISEASES.

Central Provinces.—The deaths from this cause numbered 40,251 (2.89 per mille) as against 31,710 (2.28 per mille) in 1925.

Jubbulpore continued to return the highest mortality, viz., 11.71 per mille (9.33 in 1925). It is again attributable to cold and rain.

Assam.—There were 5,300 deaths, a rate of 0.77 per mille.

Burma.—There were 11,638 deaths (1.08 per mille). Towns returned 9,126 deaths.

Bombay Presidency.—There were 103,038 deaths (83,047 in 1925), with a rate of 5.38 per mille (4.33 per mille in 1925), the highest rate recorded since the influenza year 1918, when it was 6.11 per mile. Guzerat Registration district recorded the highest number of deaths (30,419). Among Collectorates Surat, Kaira, Broach, Ahmedabad, Poona, Ahmednagar, Nasik and Khandesh each returned the highest rates ranging between 12.24 and 5.09 per mille.

North-West Frontier Province.—1,452 deaths were registered (1,549 in 1925).

Punjab.—There were 57,426 deaths—a rate of 2.80 per mille (2.65 in 1925). The urban and rural rates were 6.72 and 2.35, respectively.

United Provinces.—30,260 deaths (0.67 per mille) were registered, the rate being 0.09 and 0.07 in excess of 1925 and the quinquennial mean, respectively. Hamirpur and Lucknow with death rates of 7.70 and 4.24 per mille returned the highest mortality. The urban mortality was 7.22 and the rural one 0.21.

Madras Presidency.—The number of deaths registered was 85,602 (2.1 per mille) as compared with 74,591 (1.8 per mille) in 1925.

Bengal Presidency.—These diseases accounted for 30,589 deaths (0.66 per mille) as compared with 27,325 (0.59 per mille) in 1925. While pneumonia and phthisis' deaths were on the increase, influenza was slightly less than previously.

PNEUMONIA.

United Provinces.—The deaths numbered 5,914 (0.13 per mille) as against 4,993 (0.11 per mille) in 1925.

Bombay Presidency.—20,654 deaths were reported (1.08 per mille) against 18,950 (0.99 per mille) in 1925. Sind Registration district recorded 4,280 deaths, Guzerat Registration district 4,098, Western Registration district 1,854, Central Registration district 1,655, and Southern Registration district 228. Bombay City recorded 8,539 deaths (8,450 in 1925). The urban and rural rates were 3.79 and 0.42, respectively (3.55 and 0.37 in 1925. The highest urban and rural rates were those of Hyderabad (9.95) and Surat (2.60), respectively.

Burma.—The urban areas returned 3,421 deaths (2.74 in 1925). The highest rates were those of Monywa (6.94), Minbu (6.66) and Shwedaung (5.49).

Bengal Presidency.—There were 12,294 deaths (11,259 in 1925), the rates being 0.26 and 0.24 per mille, respectively. Pneumonia was responsible for 1.07 per cent. of total deaths and 4.2 per cent. of deaths due to respiratory diseases.

STATISTICS OF PULMONARY TUBERCULOSIS.

An exact estimate of the present incidence of this disease is still largely one of surmise; but the following notes from the various provincial reports give some idea of its prevalence.

Central Provinces.—1,754 tuberculosis patients (1,703 in 1925) were treated in hospitals and dispensaries. Of these, 463 were treated in Akola district. The disease is said to be far more prevalent than these figures indicate. The Pendra Mission sanatorium (a private institution) had 84 admissions during the year. 7 died and 71 were discharged. Government sanctioned Rs. 1,000 for the purchase of milch cattle for this sanatorium.

Burma.—Tuberculosis of the lungs appears to be increasing in towns; the death rate per mille was 1.66 against 1.65 in 1925, 1.51 in 1924, 1.32 in 1923 and 1.40 in 1922. In certain towns, notably Rangoon, Tharrawaddy, Mawlamyainggyun and Myaungmya the death ratios show a much more marked increase. The proposal to provide a sanatorium at Meiktila was still under consideration.

Bombay Presidency.—21,892 deaths were registered as due to phthisis—i.e., a death rate of 1.14 as against 17,832 and 0.93, respectively, in 1925. The Central Registration district reported the largest number of deaths (5,950), followed by Western (5,460), Guzerat (5,168), Southern (2,655) and Sind (1,120). Bombay City recorded 1,539 deaths (1.34 per mille). The urban and rural figures were 1.83 and 0.97 against 1.58 and 0.77, respectively, in 1925. Highest urban rates were recorded in Dharangaon (6.21), Rander (5.97), Bhiwandi (4.43), Ahmedabad (4.18), Poona (3.71), Nasik (3.16), Pandharpur (3.13), Ilkal (3.12), Hyderabad (3.08), Chiplun (3.00), Surat (2.99), and Ratnagiri (2.73); the highest rural rates were those in Kolaba (3.04), Ratnagiri (2.52), Kaira (2.10), and Thana (1.46). The mortality was highest between 20 and 40 years of age. In Guzerat, the congestion in some big cities and certain customs prevailing in some communities like the purdah among the Bohra women, early marriage followed by repeated pregnancies among the better class Hindus, and the practice of conducting confinements in dark and ill-ventilated rooms, were largely responsible for the high death rate from phthisis.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Urinary Tract Disinfection

In all cases of infections of the urinary tract it is the safe and wise course always to prescribe Caprokol immediately without waiting for a complete diagnosis. There is no condition in which the use of Caprokol is contra-indicated ; thus, even if some new form of therapy be indicated after the final diagnosis, the subsequent treatment cannot be prejudiced by this early treatment.

On the other hand, the effect of Caprokol administration in the early stages is often amazing in its rapidity. The distressing symptoms are relieved, and the patient is restored to a condition of ease and comfort ; he enjoys hours of continuous rest hitherto made impossible by the necessity for frequent micturition, his appetite and general health improve, fever disappears and finally sterile urine is produced, in most infections, in two or three weeks. It is important that the treatment should be continued after symptomatic relief is obtained. Indeed, cessation of the treatment should not be considered until sterility of the urine has persisted for a fortnight at least.

CAPROKOL

Issued in capsules for adults, in solution for children.

Descriptive literature will be sent on request to the B.D.H. representatives resident in India :—

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Bldgs.,
Parsee Bazar Street,
Fort, BOMBAY.

THE BRITISH DRUG HOUSES LIMITED
LONDON

Ca/In/293.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOOK YOUR ORDER NOW at the SPECIAL PRICE

FORTY-SEVENTH ISSUE
NOW IN PREPARATION.

THE

MEDICAL ANNUAL, 1929

A Year Book of Treatment and Practitioner's Index
A Review of the Year's Progress in Medicine and Surgery

Subscribers, Pre-Publication, Rs. 11-8.
On Publication, Rs. 15-0 net.
Fully Illustrated in Colour and Black and White.

SOME CONTRIBUTORS TO THE NEW VOLUME.

J. H. ANDERSON, C.M.G., C.B.E., M.D.
JOSEPH BLOMFIELD, O.B.E., B.A., M.D.
W. LANGDON BROWN, M.A., M.D., F.R.C.P.
IVOR J. DAVIES, M.D., F.R.C.P.
HENRY DEVINE, O.B.E., M.D., F.R.C.P.
ALBERT EIDINOW, M.B., B.S., M.R.C.S.
JOHN FRASER, M.C., M.D., F.R.C.S.
A. G. GIBSON, M.A., M.D., B.SC., F.R.C.P.
A. M. H. GRAY, C.B.E., M.D., F.R.C.P.
E. W. HEY GROVES, M.S., M.D., F.R.C.S.
GEOFFREY HADFIELD, M.D., M.R.C.P.
L. W. HARRISON, D.S.O., M.B., CH.B., F.R.C.P.E., BREV.-COL., R.A.M.C. (Rtd.)
CHAS. THURSTAN HOLLAND, CH.M., M.R.C.S., L.R.C.P., F.R.C.S., D.L.
ROBERT HUTCHISON, M.D., F.R.C.P.
GEOFFREY JEFFERSON, M.S., F.R.C.S.
A. E. J. LISTER, M.B., B.S., F.R.C.S., LT-COL., I.M.S. (Rtd.)
J. P. LOCKHART-MUMMERY, M.A., M.B., B.CH., F.R.C.S.
HUGH MACLEAN, M.D., F.R.C.P.
REGINALD MILLER, M.D., F.R.C.P.
JOSEPH PRIESTLEY, B.A., M.D., D.P.H.
SIR JAMES PURVES-STEWART, K.C.M.G., C.B., M.D., F.R.C.P.
SIR LEONARD ROGERS, C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S., LT.-COL., I.M.S. (Rtd.)
J. D. ROLLESTON, M.A., M.D., M.R.C.P.
W. G. SAVAGE, M.D., B.SC., D.P.H.
A. RENDLE SHORT, M.D., B.SC., F.R.C.S.
EDMUND I. SPRIGGS, M.D., F.R.C.P.
SIR JOHN THOMSON-WALKER, O.B.E., M.B., F.R.C.S.
SIR W. I. DE COURCY WHEELER, M.D., F.R.C.S.I.
H. BECKWITH WHITEHOUSE, M.S., CH.M., F.R.C.S.
A. DICKSON WRIGHT, M.S., M.B., F.R.C.S.
A. J. M. WRIGHT, M.B., F.R.C.S.
WILLIAM H. WYNN, M.D., M.SC., F.R.C.P.

Associate Editors : *Medicine* CAREY F. COOMBS, M.D., F.R.C.P. *Surgery* A. RENDLE SHORT, M.D., B.SC., F.R.C.S.

Extracts from Press Notices of recent Volumes.

British Medical Journal.—"The 'Medical Annual' is an old and tried friend and its reappearance is always welcome; the forty-sixth issue, with its array of able contributors and its wealth of practical information, fulfils our expectations."

Indian Medical Gazette.—"To the general practitioner in this country the 'Medical Annual' is a godsend. It enables him by the expenditure of a comparatively small sum to keep up to date in all branches of his profession. To the specialist also it is an extremely valuable publication."

THACKER, SPINK & CO., P. O. Box 54, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

United Provinces.—Phthisis caused 6,380 deaths with a ratio of 0.14 per mille (5,442 deaths with a ratio of 0.12 in 1925). The Lucknow Anti-Tuberculosis League have resolved to establish a special tuberculosis hospital in Lucknow at an estimated cost of Rs. 2 lakhs. The Local Government have promised an annual recurring grant of Rs. 32,000 for its upkeep. A site, free of cost, has been given by the Lucknow University for the purpose. The hospital, when ready, will supply a long-felt want.

Bengal Presidency.—Phthisis caused 7,032 deaths (0.15 per mille) against 6,079 (0.13 per mille) in 1925. 22 towns did not report any deaths from this cause, 13 towns returned death rates of 1.0 per mille and above and the rest below that. A little more than 50 per cent. of phthisis deaths in all towns occurred in Calcutta only. High rates were registered in Kurseong (5.4 per mille) and Calcutta (2.4 per mille). It was responsible for 0.6 per cent. of the total mortality (all causes) and 22.9 per cent. of that due to respiratory diseases.

DYSENTERY AND DIARRHŒA.

256,293 deaths (1.06 per mille) were recorded against 208,412 deaths (0.86 per mille) in the previous year.

CHOLERA.

Statistics in British India.

Bengal Presidency.—There were 59,106 deaths (1.3 per mille) as against 34,276 (0.7 per mille) in 1925, an increase of 85.7 per cent. over the figure for the previous year. Cholera was reported from 590 out of 632 registration circles. 299,079 cholera inoculations were performed. 17,284 wells and 9,588 tanks were disinfected. 100 sanitary inspectors and 25 sub-assistant surgeons in addition to medical officers attached to the public health department co-operated with the local bodies in combating the epidemic.

Bombay Presidency.—The Presidency with only 73 deaths (57 in 1925), remained practically free for another year. The Western Registration district alone returned 43 deaths. Out of a grant of Rs. 15,000 sanctioned by Government for anti-cholera measures Rs. 750 were spent.

Bihar and Orissa.—The death rate rose from 0.5 per mille in 1925 to 0.8 in 1926. Patna district recorded the highest rate (1.8 per mille). Lalganj (12.1), Hajipur (5.9) and Jamalpur (5.1) recorded the highest rates among urban areas. The epidemic cadre of ten assistant surgeons was maintained, as also the reserve of 100 vaccinators for special cholera and other epidemic duties. 5,790 doses of cholera vaccine were issued to civil surgeons from Namkum. A reserve stock of kaolin, bleaching powder and potassium permanganate was supplied to civil surgeons.

Punjab.—Only 87 deaths were recorded (3,049 in 1925). An outbreak of a disease resembling cholera and of indigenous origin was reported from a village just outside Simla. On investigation the disease was found to be clinically indistinguishable from true cholera. The post-mortem and bacteriological findings, however, definitely negatived the diagnosis of cholera. No information is available as to the real cause of the disease or the extent to which it was responsible for the total cholera mortality.

United Provinces.—Deaths numbered 6,166 (0.13 per mille) as compared with 7,653 (0.17 per mille) in the previous year. The urban and rural figures were 0.09 and 0.14, respectively. In the 20 districts under the cholera scheme 5,091 deaths from cholera were recorded while the remaining 28 districts returned 1,075 deaths.

Central Provinces.—4,565 deaths were recorded (124 in 1925). Bilaspur district returned the highest mortality (1,482 deaths) and infection was imported by pilgrims returning from Allahabad. 20,778 anti-cholera inoculations were carried out.

Madras Presidency.—Cholera deaths numbered 24,407 (0.6 per mille) against 44,815 in 1925 (1.1 per mille). Tanjore, Tinnevelly, South Arcot, Trichinopoly, Coimbatore and Salem districts returned more than 80 per cent. of the total cholera mortality. The rules governing cholera preventive measures in municipalities were revised and rewritten. As in 1925, cholera was almost wholly confined to the southern parts of the Presidency.

Burma.—6,182 deaths were recorded. Rural areas in Pegu and Irrawaddy divisions and Akyab district together totalled 3,303 deaths as against 1,501 in the rest. The death rate for the province was 0.57 (0.18 in 1925). Owing to the severity of the epidemic, anti-cholera inoculation became highly popular, so much so that 44,314 inoculations were performed (13,965 in 1925) or almost three times the previous figure; 1,000 doses of Besredka's anti-cholera bili-vaccin tablets were purchased and distributed.

Assam.—10,275 deaths (1.49 per mille) were registered against 6,233 (0.90 per mille) in 1925. Kamrup district was the worst affected with a death rate of 6.65 per mille and the source of infection was traced to a mela held at the foot of the Bhutia hills. Cholera inoculation was resorted to with satisfactory results.

PLAGUE.

Statistics in British India.

The mortality (196,249 deaths or 0.81 per mille) was nearly double that of 1925, viz., 117,717 or 0.49 per mille). The Punjab and United Provinces with rates of 5.28 and 1.26, respectively, per mille exceeded the general death ratio.

Bihar and Orissa.—The death rate 0.2 per mille (8,381 deaths) was the same as in the previous year. 20,000 anti-plague inoculations were carried out in Muzaffarpur district.

United Provinces.—57,297 deaths (1.26 per mille) were recorded as against 49,091 deaths (1.08 per mille) in 1925 and a quinquennial average of 1.00. The urban and the rural rates were 2.14 and 1.20 (0.91 and 1.09, respectively, in 1925). Gangoh (18.32), Lakhimpur (17.42), Chandpur (16.59) and Chandausi (15.22) among towns were worst affected. A great diminution of plague mortality occurred in the towns of Agra, Muttra, Aligarh, etc., as a result of the intensive anti-rat campaign carried out there.

Punjab.—Plague was epidemic during the year, being responsible for 108,287 deaths (5.28 per mille), as compared with 37,630 (1.83 per mille) in 1925. Ambala division was the worst affected. A special scheme at an estimated cost of 2½ lakhs was launched in this division. Other affected areas were provided with emergency staff. In addition to standard anti-plague measures, the campaign concentrated its efforts on mass inoculation. All presumptive centres of recrudescence including areas known to be endemic foci of plague were listed for preventive de-ratting. It was intended that all the listed villages should be deratted thrice between August and October, but floods and other difficulties were the retarding factors.

North-West Frontier Province.—With the exception of Peshawar district with 1,575 cases and 630 deaths, the province was practically free, the figures for other districts being 7 fatal cases in Hazara and one fatal case (imported) in Dera Ismail Khan. 24,658 inoculations were performed in Peshawar district.

Central Provinces.—6,486 deaths (5,223 in 1925) were recorded, 3,132 (3,385 in 1925) of which were in Berar. Evacuation and inoculation are growing in popularity. 76,404 inoculations (40,069 in 1925) were carried out. A few cases of plague among inoculated persons were reported in Wardha, 34 with 9 deaths in Jubbulpore, 2 deaths in Hoshangabad, 20 cases with 9 deaths in Yeotmal and 2 deaths in Buldana districts.

Madras Presidency.—There were 2,143 deaths or 0.1 per mille. More than 75 per cent. of the total mortality was recorded in the three districts of Bellary (697), Coimbatore (483) and Salem (475). Hospet town (ratio 6.1 per mille) was responsible for nearly 70 per cent. of the urban mortality.

Bombay Presidency.—9,866 deaths (12,601 in 1925) were registered, the ratio being 0.51 per mille (0.66 per mille in 1925). Dharwar, Satara and East Khandesh district continued to return the heaviest mortality. Belgaum, Bijapur and Kanara districts reported milder

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

epidemics. Inoculation was the chief preventive measure and special inoculators were appointed to supplement the medical officers of dispensaries and private practitioners. Routine ratting operations were carried out throughout the year in Belgaum, Nipani, Sholapur, Pandharpur, Panchgani, Malegaon, Dhulia, Karachi, Hyderabad, Larkana, Mirpur Khas, and Tando Adam, and for shorter periods in many other towns. Systematic evacuation was rarely practised except in a few small towns and some villages. 48,900 persons were inoculated (60,831 in 1925). Among persons inoculated, 53 cases, 18 of whom were attacked within 10 days of inoculation, occurred with 22 deaths.

Burma.—1,007 deaths in rural areas (1,142 in 1925) and 1,899 in towns (2,922 in 1925) were registered.

Delhi City.—Out of the 49 cases with 38 deaths recorded, no less than 48 cases were imported ones, or in other words the city was practically free. Rat destruction was vigorously pushed on. 282,249 rats were trapped and destroyed.

Both provincial medical authorities and local bodies have been alive to the need for endeavouring to institute measures against rats where plague was endemic or severe; but in this matter one would again urge thoroughness and continuity of effort without which results are likely to be disappointing.

Punjab.—In Lahore, the total number of rats destroyed was 256,331 by trapping and 79,458 by baiting. 11,551 rat holes were smoked. In Amritsar 298,097 rats were destroyed and 4,218 holes smoked. 37,512 rats were caught and destroyed, 768 rooms were fumigated and 49,866 rats-holes were closed in Rawalpindi. 99,988 rats were destroyed in Sialkot, 38,108 in Multan and 34,671 in Ferozepore.

Delhi Province.—In Delhi City 282,249 rats were destroyed. 26,072 rats were examined for detection of plague infection and 3 of them were found infected. The total cost of the intensive rat destruction scheme amounted to Rs. 35,791 or Re. 0-2-4 per person per annum.

Bombay Presidency.—In Bombay City 579,806 rats were collected and destroyed. Of these, 283,050 rats were examined and 1,287 were found infected, giving a ratio of 0.45 infected rats per 100 rats examined.

Central Provinces.—In Nagpur town where 88,871 rats were killed, a rat destruction scheme has been pursued since 1918 with no large outbreak of plague. In Jubbulpore town 75,479 rats were destroyed, in Seoni 5,094, in Amraoti 47,357, in Amraoti Camp 10,753, in Malkapur 15,311, in Bhandara 11,158, in Akola 9,350 and in Yeotmal 9,670. Rat killing was also undertaken in many other towns during the year, e.g., Khamgaon 8,500, Burhanpur 11,884 trapped and 8,407 poisoned, Hinganghat 9,371, Wardha, 5,989, Sihora 5,276, Hoshangabad 7,617, Murtizapur 8,747, Katol 5,430, Khandwa 4,103, Basim 6,225, Karanja 4,744, etc.

Burma.—711,063 rats were destroyed (641,283 in 1925), Rangoon Corporation accounted for 669,184 and rural areas 281. In Bassein town 9,784 rats were trapped and destroyed, 0.26 rats were found infected. 2,651 rats were exterminated in Moulmein town, where as a rule 10 per cent. of the rats were always examined microscopically to ascertain plague infection among rats.

SMALL-POX.

Statistics in British India.

The total deaths from this cause were 117,066 against 85,986 in 1925. Bihar and Orissa headed the provincial list with 34,873 deaths, followed by Bengal with 25,584 deaths, the Punjab with 17,595 deaths, United Provinces with 12,020 deaths and Madras with 10,957 deaths.

Madras Presidency.—The death rate was highest in Bellary and West Godavari districts. More than half of the mortality was registered in seven districts, viz., South Arcot, Madura, Tanjore, West Godavari, Trichinopoly, Bellary and North Arcot. 4,889 (44.6 per cent.) of the total small-pox deaths were in age-group "under one year," 3,662 (33.4 per cent.) between 1 and 10 years and 2,406 (22.0) above 10 years—78 per cent. of the deaths therefore occurred among children under 10 years of age—surely a strong argument for a much more vigorous vaccination policy for the protection of children.

Assam.—The disease prevailed in an epidemic form in the Sibsagar and Kamrup districts, death rates being 3.57 and 1.19 per mille, respectively. Special regulations under the Epidemic Disease Act making vaccination compulsory have been enforced in these localities. Unscrupulous local opposition to vaccination generally and the habit of secreting cases on superstitious grounds continue to maintain the foci of infection in Sibsagar district. In Kamrup the vaccination inspecting staff was inadequate. Small-pox deaths in the province numbered 4,840 with a ratio of 0.70 per mille.

Bihar and Orissa.—The death rate increased from 0.4 in 1925 to 1.0 in 1926—largely on account of a serious epidemic in Orissa. The epidemic was most severe in Puri, Cuttack and Balasore districts. The vaccination state of the people in Orissa is said to be unsatisfactory due to poverty and ignorance. Among urban areas, the disease was severe in Gaya, Puri, Cuttack and Jugsalai which returned death rates per mille of 9.2, 8.5, 5.1 and 3.9, respectively.

United Provinces.—Small-pox claimed 12,020 deaths (9,373 in 1925), the rate per mille being 0.26 (0.21 in 1925). 3,169 deaths occurred among children under 1 year of age and 5,729 between 1—10 years of age, i.e., 74 per cent.

Punjab.—The mortality during the year (17,595 deaths) was the highest since 1920, 5,214 deaths occurred under 1 year of age and 8,060 between 1—10 years, or three-fourths of the total small-pox deaths. High rates were recorded in Montgomery, Lahore, Lyallpur and Multan districts.

Bombay Presidency.—The death rate was 0.20 against 0.29 in 1925 and 0.23, the quinquennial mean. Of the 3,922 deaths from small-pox, 963 were of infants under one year and 1,715 of children between one and ten years.

Bengal Presidency.—There were 25,584 deaths (17,436 in 1925), the ratio per mille being 0.5 (0.4 in 1925). The districts of Pabna, Bogra, Murshidabad, Howrah, Burdwan and Birbhum among themselves accounted for 37.2 per cent. of the total mortality. 8.3 per cent. of the mortality occurred among infants and 20.9 per cent. in children between 1 and 10 years—thus indicating the necessity for local bodies to direct their attention more vigorously to primary vaccination.

ANKYLOSTOMIASIS.

Burma.—27,514 prisoners were examined for ankylostoma infection in 24 jails, against 17,297 in 13 jails in 1925. Of these 9,141 or 33.22 per cent. were found to be infected (5,785 or 33.45 per cent. in 1925). Rangoon jail reported the heaviest percentage of infection (58); Henzada reported 46 per cent.; and Prome 43. In Magwe jail, among 932 prisoners only three cases of infection were found; in Katha jail two cases of light infection among 496 prisoners; while among the 186 prisoners in the Mogok jail there was not a single case.

Madras Presidency.—31,493 examinations were made to ascertain the presence of hookworm infections; of these 26,464 or 84 per cent. were found positive. Malabar district showed the highest intensity of infection, and Cuddapah the lowest. The work in North Arcot district had to be abandoned in favour of Madura district, where the district board agreed to finance an experimental scheme for rural sanitation. General hookworm surveys were made in Tanjore, at Mandapam Camp, in Malabar and South Kanara. Selected areas in Chittoor and Cuddapah districts were also surveyed.

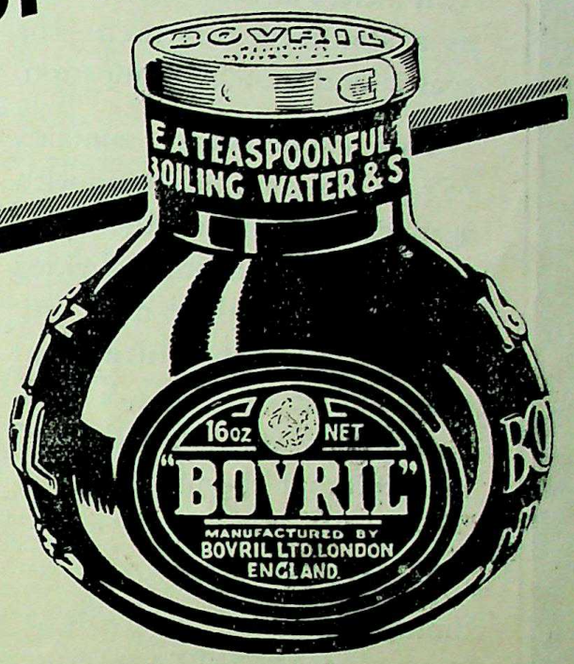
Central Provinces.—Apart from hookworm there is no doubt that helminthic infection, especially roundworm, is very extensive amongst the people of this province. The Director of Public Health estimates the incidence at least 20 per cent. in the case of hookworm and 15 per cent. in the case of roundworm. It is said that the black cotton soil of Berar is inimical to the survival or growth of the hookworm larvæ.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOVRIL Limited cordially invite any medical man visiting England to inspect their factory at any time.
148-166, Old Street, London, E.C.1.

The Value of BOVRIL in illness



Beef has well authenticated special powers of stimulating cellular activity, of restoring the tissues of the body and of toning up the whole system.

Bovril contains these powers in a highly concentra'ed, effective and digestible form. That is why Bovril has been recommended for years by the medical profession to meet the extra demands of enfeebled systems during convalescence.

BOVRIL

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A WORTHY PRODUCT

PETROLAGAR by force of its own merit has come into favour as a standard treatment for spastic and atonic constipation.

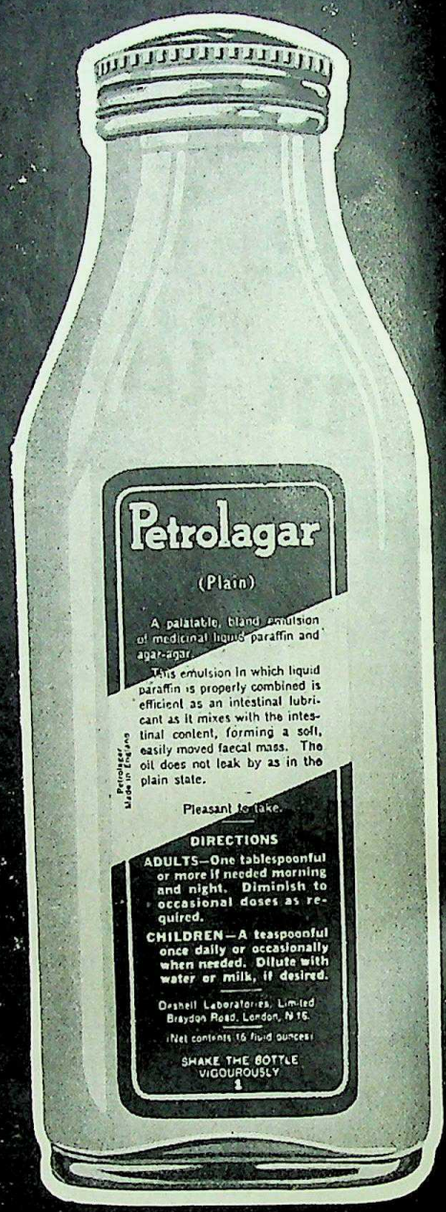
This unique product contains 65% pure paraffin emulsified with agar-agar by a process that splits the oil into such finely divided particles that they mix intimately with the intestinal contents. It produces a soft, well formed, easily-passed faecal mass without the use of drugs

Agencies in India:

Smith, Stanistreet & Co. Ltd., CALCUTTA.

Kemp & Co. Ltd., BOMBAY.

Spencer & Co. Ltd., MADRAS.



Petrolagar Alkaline is specially valued in the Tropics as by its bland and mildly alkaline action it allays inflammation and has a soothing effect on the bowel. The oil present is not absorbed, therefore it is not heat producing. Petrolagar is manufactured by a special mechanical process which requires no handling.

Petrolagar

Petrolagar' is the trade mark distinguishing the fine emulsion of mineral oil and agar-agar. Issued in four varieties: Plain, with Phenolphthalein, Alkaline and Unsweetened, manufactured only by Deshell Laboratories, Ltd., London, N.16.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LEPROSY.

Madras Presidency.—The district health officers were required to make as accurate an estimate as possible of the leper population in their districts as the census figures of 1921 are thought to be obviously an underestimate. The effort has met with little or no success.

Central Provinces.—454 cases of leprosy were treated in hospitals and dispensaries. 637 patients were treated at leper asylums. Such asylums exist in Patpara (Mandla district), Raipur and Dhamtari (Raipur district), Champa and Mungeli (Bilaspur district), Chandkhuri (Drug district), Kothara (Amraoti district) and Rajnandgaon (Rajnandgaon State). The Deputy Commissioners of Raipur and Bilaspur recommended a leprosy survey being undertaken to ascertain the areas where it is most prevalent. Out of the subscriptions amounting to Rs. 2,07,777-4-0 promised for the British Empire Leprosy Fund (excluding irrecoverable sums), Rs. 2,06,737-2-0 have been collected. It is hoped to start leprosy clinics at selected dispensaries and also to provide special treatment at all dispensaries.

Eight assistant medical officers were given the necessary training in the treatment and diagnosis of leprosy at the special leprosy class held at Champa in Bilaspur district.

Burma.—The provisions of the Indian Lepers Act, 1898, were extended to the whole of Burma; and lepers were prohibited by Government Notification from following certain trades and businesses. Ward headmen, village headmen and the warders of the Rangoon leper asylum, Kemmendine, and St. John's Asylum, Mandalay, were empowered to arrest within their jurisdiction, without warrant, any person who appears to be a pauper leper or any leper who escapes from or leaves the asylum. The local Government have also sanctioned as an experimental measure for two years the establishment of three or more dispensaries for the treatment of lepers in selected leper villages for which Rs. 27,000 were provided in the budget estimates for 1927-28. A leper clinic was opened by Government at the Rangoon General Hospital. Government contributed Rs. 6,000 to the Home for lepers, Mandalay, for a new ward. Proposals for extending the accommodation of the existing asylums and for a leper colony in the province were under the consideration of the local Government.

At the four leper asylums at Kemmendine, Moulmein and Mandalay, 24,425 patients were treated.

Twenty-three lepers from the Indian ports (14 in 1925) disembarked at Rangoon. All except one were allowed to proceed to their destination.

STATISTICS FOR RABIES.

Central Provinces.—Anti-rabic centres increased from two to five. Rabies is said to have caused 159 deaths (187 in 1925). 478 dog-bite cases and 36 cases of bites by other animals were recorded in municipal and other towns, and 228 and 24, respectively, in rural areas. The total number of patients treated at the five centres were Nagpur 513, Hoshangabad 122 with 2 deaths, Akola 157 with 2 deaths, Jubbulpore 341 with 4 deaths, and Raipur 39. 15,681 stray dogs were killed in municipal towns (12,950 in 1925).

Bombay Presidency.—234 deaths were reported (151 males and 83 females), 45 in towns and 189 in rural areas.

Punjab.—172 deaths, of which 34 were in towns and 138 in rural areas, were reported. The provincial bacteriological laboratory of the King Edward Medical College at Lahore treated 2,178 patients (197 Europeans and 1,981 Indians).

Madras Presidency.—488 deaths were registered—100 in towns and 388 in rural areas.

Bengal Presidency.—349 deaths from this cause were recorded during the year—65 in towns and 284 in rural areas. Calcutta recorded 36 deaths. The death rate was highest in Calcutta and Nadia (0.03).

MORTALITY FROM WILD ANIMALS.

The total number of persons killed by wild animals in British India during 1926 amounted to 1,987, as against 1,962 in the previous year and 2,587 in 1924. Tigers were responsible for 875 deaths, leopards for 183, wolves for 367, bears for 96, elephants for 58 and hyænas for 15. Deaths continued to be highest from tigers in Madras, from leopards in the Central Provinces and Berar, from wolves in the United Provinces, from bears in Bihar and Orissa and from elephants in Assam. Of the 393 deaths from "other animals" about 41 are assigned to wild pigs and 151 to crocodiles and alligators. The highest number of deaths from all wild animals occurred in the United Provinces (532), Madras, Bihar and Orissa and the Central Provinces and Berar coming next in order. The mortality from elephants showed a marked decrease. The mortality in the majority of the provinces was less than in the previous year, but in the United Provinces, Bengal, the Punjab and Burma it was slightly greater.

Deaths from snake-bite increased from 19,258 to 19,718. Increases occurred in Madras, Bombay, Bengal, the United Provinces and Burma, but the Punjab, Bihar and Orissa, the Central Provinces and Berar and Assam have reported decreases.

During the year under review 23,689 wild animals were reported to have been destroyed, of which 1,288 were tigers, 4,247 leopards, 2,633 bears and 3,025 wolves. A sum of Rs. 1,40,061 was paid in rewards, against Rs. 1,55,667 in the previous year. The number of snakes destroyed in India proper increased from 41,004 to 46,012 and the rewards paid for their destruction were Rs. 1,615 as against Rs. 1,579 in the previous year.

VACCINATION AGAINST SMALL-POX.

Vaccination operations increased from 11,987,640 (8,656,193 primary and 3,331,447 revaccinations) in 1925-26 to 12,260,977 (8,631,379 primary and 3,629,598 revaccinations) in 1926-27. Bengal contributed largely to the increase. Delhi, United Provinces, North-West Frontier Province, Madras, Coorg, Bombay, Burma and Ajmer-Merwara all recorded decreases. In Delhi the decrease was attributed partly to the effects of malaria in the autumn; in the United Provinces the appointment of new vaccinators in place of the experienced ones who were deputed to the Kumbh fairs accounted for the decrease; in the North-West Frontier Province and Burma the decrease was ascribed to the epidemic of small-pox not being as severe as in the previous year: in Madras the reduced incidence of small-pox in some districts and prevalence of cholera, lack of unprotected children, etc., in others were the chief causes; in Bombay the prevalence of cholera retarded progress: and in Burma it was ascribed to a reduced incidence of small-pox. Bihar and Orissa, Delhi, United Provinces, Punjab, Madras, Coorg, Bombay and Ajmer-Merwara all show an increased percentage of primary successes, the first leading with 99.66 per cent. (99.65 in 1925-26). As in the previous year, re-vaccination showed a gratifying increase from 3,331,447 in 1925-26 to 3,629,598 in 1926-27, while its success rate rose in Assam, United Provinces, Punjab, North-West Frontier Province, Coorg and Ajmer-Merwara. The small-pox mortality increased from 85,986 in 1925 to 117,066 in 1926, Bihar and Orissa alone accounting for an increase of 20,491, followed by Punjab with an increase of 10,557. The average cost of each successful operation increased slightly; that in Bombay is still more than double the cost in any other province except Burma.

ANNUAL REPORT ON THE ADMINISTRATION OF JAILS OF THE BENGAL PRESIDENCY, 1927. BY LT.-COL., W. G. HAMILTON, I.M.S., INSPECTOR-GENERAL OF PRISONS. BENGAL. CALCUTTA: BENGAL SECRETARIAT BOOK DEPOT, 1928. PRICE Rs. 4 OR 6*s.* 9*d.* NET.

THE number of convicts on the 1st January was 10,368, against 9,982 in 1926; 23,970 were imprisoned during the year 1927, against 21,834 in the previous year, and 416 were received by transfer from other provinces.

Convicts were disposed of as follows: 705 were released on appeal; 16,302 on expiry

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of sentence, 5,678 under remission rules, 136 by order of Government, 206 were transported beyond the seas, 23 were transferred to mental hospitals, 4 remained uncaptured out of those who escaped during the year, 7 were executed and 167 died. The number remaining at the end of the year and the daily average number for the year was 10,916 and 10,875.27, against 10,341 and 10,181.47 in 1926.

The average number of European prisoners was 30.03 against 47.67 during the previous year.

Transportation of convicts.—During the year 1927, 205 convicts were deported to Port Blair. These include 145 convicts transferred from the Punjab, 40 from the Central Provinces, 12 from the United Provinces, 7 from Bengal and 1 from the Bombay Presidency. The 7 convicts deported from Bengal volunteered as colonists. Seventy-three transportation convicts were repatriated from the Andamans on medical grounds, of whom three died during the year against one in the previous year.

Religion.—Of the 23,970 convicts admitted during the year, 56.29 per cent. were Muhammadans, 40.45 per cent. Hindus, 0.67 per cent. Christians, 0.92 per cent. Buddhists and Jains, 1.67 per cent. belong to all other classes against 56.06, 40.68, 0.76, 1.30 and 1.20 per cent. respectively in the previous year.

Age.—The number of convicts of less than 16 years of age admitted was 335 (329 males and 6 females) or 1.40 per cent. of the total of all classes of convicts, against 240 or 1.09 per cent. in 1926.

It is a matter of great regret that there has again been a considerable rise in the admission of juvenile prisoners during the year under notice as compared with the figures of the preceding two years, which stood at 240 and 128, respectively. This is partly due to the admission of many young boys as Satyagrahis at Patuakhali Sub-Jail where 153 were admitted during the year. The extension of the Children Act to the whole Presidency is an urgent necessity, until that is done young children will be committed to prison.

The percentage of convicts admitted from 16 to 18 years was 3.51, 19 to 21 years of age 9.61, 22 to 30 years 42.70, 31 to 40 years 28.85 and above 40 years 14.33 against 3.92, 7.82, 39.63, 28.55 and 18.99, respectively, in the previous year. It will thus be seen that the greatest tendency to crime falls between the ages of 22 and 30 years.

Education.—The number of convicts able to read and write was 10.49 per cent., able to read only 2.35 per cent., and illiterate 87.16 per cent.

Female convicts.—Direct admission from Court was 482 against 420 in 1926. Of these 217 were Hindus, 143 Muhammadans, 13 Christians and 109 belonging to all other classes. Six were under 16 years of age, 10—16 to 18, 28—19 to 21, 216—22 to 30, 129—31 to 40, and 93 over 40 years old. Here, again, we find the greatest tendency to crime to fall between the ages of 22 and 30 years. Twelve were able to read and write, 1 able to read only, and 469 illiterate; 240 were married, 4 unmarried, 175 widows and 63 prostitutes; 2 female convicts died during the year against 1 in the previous year. The daily average number for the year was 103.95 against 103.32 in 1926.

Juvenile crime.—The daily average strength of the Juvenile Jail fell from 185.36 (28.54 under-trials and 156.82 convicts) to 83.27 (1.26 under-trials and 82.01 convicts). The fall in the average number of convicts was due to the fact that the jail was emptied of its convicts when the Reformatory School was started, and that boys convicted under the Bengal Children Act were admitted to the Reformatory School. The fall in the number of under-trials is due to the enforcement of the Bengal Children Act in Calcutta and its suburbs, the accused being detained in Remand Homes.

The Reformatory School and the Industrial School which was started in July in the Juvenile Jail were transferred to the control of the Education Department from 1st April, 1928, the Jail being abolished from that date.

As usual moral and religious instructions were imparted and all reasonable facilities were allowed to the prisoners to observe their religious practices.

Regular physical training and exercises were imparted to the boys and football, badminton and other games were regularly played.

Technical instruction in such trades and crafts as tailoring, carpentry, blacksmith's work, weaving and gardening was given to make the boys self-supporting after their release.

Civil Prisoners.—Twelve such prisoners remained in jails on the 1st January, 1927, and 334 prisoners were received during the year, making a total of 346 prisoners, of whom 326 were released, leaving a balance of 20. There were no escapes or deaths among these prisoners. The daily average number for the year was 21.16 against 17.00 in the preceding year. There was a marked increase in the number admitted during the year.

State prisoners.—The number remaining at the beginning of the year was 6 and 17 were received during the year, either direct or by transfer from other jails, making a total of 23. Of these 22 were released or transferred, leaving a balance of 1 at the close of the year. There were no escapes or deaths among these prisoners. The daily average number for the year was 2.48. These prisoners are treated in accordance with the rules specially made by Government for their treatment.

Detenus.—This class of prisoners is detained under the provisions of the Bengal Criminal Law Amendment Act, 1925. Under the orders of Government they are excluded from jail statistics. There were 4 such detenus at the end of the year. The rules for their treatment are the same as those for State prisoners.

Jail buildings.—The amount expended on jail buildings during the year was Rs. 9,29,521 for original works and Rs. 2,34,247 for repairs. The main items of expenditure were the following projects: purchasing the site of the Army Clothing Storage Department; structural alterations in the Alipore Juvenile Jail.

Warder Guard.—It is very difficult to get suitable recruits and the Circle Jails find it increasingly difficult to fill up existing vacancies. The question of improving the pay and other conditions of the warder service has long been pending.

It is also essential to give warders some preliminary training before they are placed in charge of prisoners. It is ludicrous to expect intelligent work from men who have had no instruction in their duties. Under present conditions the force is so understaffed that it is impossible to find time for any preliminary training.

Escapes and recaptures.—During the year there were 16 escapes among convicts, 7 from inside and 9 from outside the jails; 12 of them were recaptured before the close of the year. Of the 9 escapes from outside the jails, 4 were from gardens, viz., 2 from the Presidency Jail and 1 each from Midnapore Central Jail and Rangpur Jail and 5 while engaged in extramural labour, viz., one each from Jessore Jail and Tamluk, Jangipur, Bongaon and Kishoreganj Sub-Jails.

In the Alipore Reformatory School, one Reformatory boy escaped through the lines of a Reformatory School.

The total number of offences committed was 26,779 against 18,376 in 1926. The number of punishments inflicted during the year was 26,779.

It will be noticed that the number of punishments inflicted on prisoners during the past year has shown a marked increase, particularly with offences connected with work and with prohibited articles; this looks as if stricter supervision has been exercised and that a higher standard of discipline has been enforced in the Central Jails.

Corporal punishment.—The following gives particulars regarding the corporal punishments inflicted during the year prepared in accordance with the Government of India, Home Department, letter No. 142, dated the 24th September, 1919:—

(1) Daily average number of male prisoners for the year 1927—10,558.22.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

VITAMIN D
in infant feeding

"When its mother's milk lacks Vitamins the infant suffers from marasmus–general feebleness"

Indian Medical Gazette, Feb., 1927

"..... The fact that Vitamin D deficiency appears to be largely responsible for marasmus in young infants and for rickets at a later period accords with some .... recent experiments."

From an article in a Leading Medical Journal, Jan. 1928

The richest milk in the world in Vitamins is New Zealand milk from which Glaxo is made

Glaxo

The Vitamin Milk-Food

Further information and literature gladly sent on request:
H. J. FOSTER & Co., Ltd., P.O. Box 202, BOMBAY

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

4 Reasons

for prescribing

Placento-Mammary Co.

(Harrower)

IN AGALACTIA

1. MAMMARY stimulates mammary activity ; tends to inhibit menstruation during the nursing period through its well-known antagonism to the ovarian function ; reduces uterine congestion and oozing.
2. PITUITARY re-enforces the action of mammary substance ; it also has a powerful musculotonic effect.
3. PLACENTA favours lactation and uterine involution.
4. THESE THREE EXTRACTS embodied in Placento-Mammary Co. Harrower) are products of high quality. The many years of experience with this formula are an assurance of its thorough dependability.

THE ENDOCRINE LABORATORY, SIMLA.

ENDOCRINES LIMITED

WATFORD, HERTS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(2) Total number of jail offences—23,046.
(3) Total number of prisoners punished by whipping—15.

The ratio of whipping to total number of punishment was 0.04 against 0.02 in 1926. In 20 jails there was no corporal punishment.

The number of convicts released under the remission rules was 5,703, against 5,195 in the previous year.

Financial.—The cost of guarding and maintaining prisoners in jails and subsidiary jails of the Presidency, including the cost of general supervision amounted to Rs. 25,09,958 against Rs. 23,82,569 in 1926.

The daily average number of convicts under sentence of labour increased from 9,601.58 to 10,736.75 this year. The average number of sick, convalescent and infirm and the number not employed for other reasons were 409.29, 194.80 and 437.21, respectively, and the balance available for work was 9,695.45 against 8,673.83 in 1926.

Accommodation.—Excluding hospital and observation cells, the Central and District Jails have accommodation for 10,883 male and 400 female convicts, 1,143 male and 14 female under-trials and 141 civil prisoners. Excluding the sick in these jails, the average population was 10,204.56 convicts, of which 10,105.32 were males and 98.24 females, under-trials 1,461.29 males and 20.22 females, 20.62 civil prisoners and 2.44 State prisoners.

Statement No. XIV.—The daily average strength for the year was 13,536.13, the number admitted to hospitals 12,952, and the daily average number of sick 439.73, against 12,771.80, 11,737 and 402.17, respectively, in 1926. The total number of deaths during the year was 197 against 175 in the previous year.

SICKNESS AND MORTALITY.

The death rate in 1927 was 14.5 which is slightly higher than that of the previous year, which was 13.7. Although the rate is higher than the two previous years, it is lower than it was for several years before 1924.

Cholera.—There was one case of cholera in the Alipore Central Jail and one death during the year under report, against 2 cases in the previous year, but no deaths.

Dysentery.—There were 526 admissions and 14 deaths from this disease, against 421 cases and 14 deaths in the previous year. Although the number of admissions showed a marked rise as compared with that of the previous year, the number of deaths remained stationary. Comilla had the largest number of cases (139 against 47 in 1926). Barisal had only 5 cases, against 81, 214 and 6 in 1924, 1925 and 1926, respectively. It is gratifying to note the excellent result maintained in the Barisal Jail during the year under report. The incidence and mortality of the disease have been steadily kept down in this jail since 1926. Other jails showing high admission rates were Dinajpur (80), Jalpaiguri (40) and Rangpur (37).

Malaria.—There were 3,080 cases and 16 deaths, against 2,920 and 10, respectively, in 1926. Anti-malarial measures are carried out in most districts where malaria is prevalent. Midnapore, Faridpur, Rajshahi, Alipore, Burdwan and Rangpur all show high admission rates.

Pulmonary tuberculosis.—There were 133 admissions and 32 deaths, against 124 and 25, respectively, in the previous year. Suitable cases were treated in the two special jail hospitals, viz., at Suri for Western Bengal prisoners and Comilla for Eastern and Northern Bengal prisoners.

The mortality from this disease is very high in our jails. The great majority of cases are already infected on their admission to jail.

Pneumonia.—There were 82 cases and 19 deaths against 93 cases and 17 deaths in 1926.

Healthy and unhealthy jails.—The jails with lowest death rates were Berhampore (6.59 per mille), Bankura (6.64), Midnapore (8.31), Pabna (8.38), Bogra (8.49), Hooghly (8.53) and Presidency (Indian) (9.73). The jails with the highest death rates were Rangpur (48.34), Darjeeling (35.29), Jalpaiguri (31.14) and Khulna (31.08).

Religious instruction.—As usual, prisoners were given reasonable facilities to observe their religous practices in jails and honorary religious instructors visited the jails regularly.

Correspondence.

THE POSITION OF THE INDIAN MEDICAL COUNCILS TO THE GENERAL MEDICAL COUNCIL OF LONDON AND THE STATUS OF BRITISH ENGLISH MEDICAL DEGREES AND DIPLOMAS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I shall feel much obliged if you, or the readers of your esteemed journal, will give their views on the following subject which greatly concerns the medical profession in general.

What is the status of the qualifications of L. S. A. (London), L. A. H. (Dublin), and the licentiates and memberships of the Royal Colleges compared to the M. B. of the Indian Universities and membership licences of the College of Physicians and Surgeons, Bombay, of the State Medical Faculty of Bengal and other Indian medical licencing boards?

Whether qualifications obtained in Europe which are registrable in the British Medical Register of the General Medical Council are considered in their value and status, superior, equal or inferior to the Indian University medical degrees and membership diplomas of the College of Physicians and Surgeons, Bombay and of the State Medical Faculty of Bengal, for the purposes of naval, military and higher grade, state or public, appointments?

As far as I am aware up to the time of writing, all the regular degrees and diplomas of the English, Scotch, and Irish boards and examining bodies are registrable in the British Medical Register. This means they comply with the requirements of the General Medical Council—which is constituted of representatives from all the teaching bodies. The holders of them are equally eligible for all appointments, though special appointments are open to those who hold special qualifications.

Regarding India, the degrees of Bombay, Calcutta, Madras, Lahore, Lucknow, Colombo, Singapore are registrable in the British Medical Register, though recognition of Calcutta University was temporarily withdrawn. No recognition to membership licences of the College of Physicians and Surgeons, Bombay or State Medical Faculty of Bengal has been accorded for the purposes of registration in the British Medical Register.

This means that the General Medical Council accords recognition for the purposes of registration to those Indian degrees and diplomas whose courses are equivalent to theirs. Since no recognition till now has been accorded to Indian membership licences, which are considered here to be higher than the ordinary Indian licences, it means of course that their curriculum does not fulfil the present requirements of the General Medical Council. It is possible that at some future date recognition may be accorded, if necessary improvements are complied with.

The commission in the Indian Medical Service (temporary) has been given to those who have passed the membership examination of the College of Physicians and Surgeons, Bombay and of the State Medical Faculty Bengal, and such officers have been given higher civil appointments.

Many of the past and the present permanent officers in the Indian Medical Service with their home qualifications of L. S. A. (London), L. A. H. (Dublin), and Licences of Royal Colleges, obtained commissions, and higher colonial and civil appointments. Does this

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

mean that their qualifications are superior, equal, or uncomparable?

The reply by the Indian Medical Council (Bombay) is not clear, hence I am seeking the hospitality of your columns as the matter concerns all the medical institutions.

The position of the Indian Medical Councils with the General Medical Council of Great Britain is, I believe, independent and not subordinate, but nevertheless they adopt and adhere to the rulings of that body. What does this signify to their relativity? It is now for the General Medical Council of Great Britain to assert their authority and show the rightful right.—Yours, etc.

K. M. HIRANANDANY, EX.M.P. (Dublin).

HYDERABAD, K. J. ROAD, SIND.
4th December, 1928.

NIGHT-BLINDNESS AND ITS SPEEDY CURE WITH LIVER.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—In your August number, I have just read Dr. J. M. Richardson's letter regarding night-blindness and its speedy cure under treatment with liver. Obviously, there are cases of functional night-blindness in which there are no ophthalmic changes and which are the result merely of defective nutrition, anæmia, ill-health, etc. The rapid improvement under liver treatment is not, therefore, surprising while conversely, failure of treatment with cod-liver oil is also not surprising, as it is a truism that only certain brands of this are of any medical value.—Yours, etc.

B. J. BOUCHÉ, M.R.C.S. (Eng.), L.R.C.P. (Lond.), I.M.D.

B. M. HOSPITAL, DINAPORE.
25th December, 1928.

TREATMENT OF GONORRHŒA.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Recently I treated 2 cases of acute gonorrhœa by irrigation with warm E. C. lotion, 1 in 20. I used a douche can and Janet pattern glass nozzle. The irrigation was carried out thrice daily after micturition. An alkali mixture was given by the mouth to keep the urine alkaline. The result was magical; all urethral discharge in each case was stopped after 24 and 48 hours, respectively.—Yours, etc.,

M. S. PAL, I.M.D. (Retd.),
Deamoolie Tea Estate.

DOOM-DOOMA P. O., UPPER ASSAM.
7th January, 1929.

AURICULAR FIBRILLATION AFTER ASPIRIN.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I was very interested to read of the case of auricular fibrillation brought on as a result of taking acetylsalicylic acid reported by Dr. A. K. Dutt Gupta in the September issue of the *Gazette*.

The interest is intensified because it seems to confirm the value of the formula

$$F = \frac{P + I}{S + T}$$

where F = fibrillation or failure
P = blood-pressure
I = impluses, nervous or otherwise
S = support of heart afforded by the pericardium
T = tone of muscle.

The support of the pericardium is due to the negative pressure in the pericardial cavity which I have shown is present in health. This negative pressure causes a suction action which keeps the pericardium right up against the heart save for the thin layer of pericardial fluid so necessary for lubrication. F varies directly with the pressure or nervous impulses, i.e., the greater the pressure the greater the tendency to failure or fibrillation. On the other hand, the greater the support the less the tendency to failure.

The normal negative pressure and pericardial fluid depend on the normal healthy exudation which takes place through the coronary vessels, and any variation of this exudation tends to modify the support of the heart.

If we apply the formula it will be seen that though the blood-pressure P remains constant, yet because S the support is diminished, it follows that the tendency to F (fibrillation) is increased.

The acetylsalicylic acid evidently disturbed the exudation into the pericardial cavity and so modified the pericardial support.

Further details of my formula will be found in the *New York Medical Journal and Record* for 21st March, 1928, as well as in the *Medical Press and Circular* for 1st February, 1928, and the *Lancet*, 1st September, 1928.—Yours, etc.,

G. ARBOUR STEPHENS,
Consulting Cardiologist,
King Edward VII Welsh National Memorial Association.

SWANSEA,
31st December, 1928.

Service Notes.

APPOINTMENTS AND TRANSFERS.

ON return from leave, Lieut.-Colonel Sir Frank Powell Connor, *Kt.*, D.S.O., F.R.C.S., I.M.S., was reposted as Professor of Surgery, Medical College, and Surgeon to the Medical College Hospitals, with effect from the 16th December, 1928.

Lieut.-Colonel W. D. Ritchie, M.B., I.M.S., Civil Surgeon, Darrang, is appointed to officiate as Inspector-General of Civil Hospitals and Prisons, Assam, during the absence on leave of Colonel Hutcheson.

Lieut.-Colonel Sir L. Rogers, *Kt.*, C.I.E., M.D., F.R.S., F.R.C.P., F.R.C.S., I.M.S. (Retired), is granted the temporary rank of Major-General whilst Medical Adviser to the Secretary of State for India and President of the India Office Medical Board, 3rd November, 1928.

On being relieved of his appointment as Professor of Surgery, Medical College, and Surgeon to the Medical College Hospitals, Lieut.-Colonel H. B. Steen, M.D., I.M.S., was appointed to act as Professor of Clinical and Operative Surgery, Medical College, and Surgeon to the Medical College Hospitals, with effect from the 16th December, 1928.

On return from leave, Lieut.-Colonel R. F. Steel, M.B., B.ch. (Dub.), F.R.C.S.E., I.M.S., to be Civil Surgeon and Superintendent, B. J. Medical School, Poona.

On return from leave Lieut.-Colonel K. G. Gharpurey, L.R.C.P. & S. (Edin.), L.F.P. & S. (Glas.), I.M.S., to officiate as Civil Surgeon, Nasik.

Major H. S. Anand, M.B., ch.B., D.P.H., I.M.S., is appointed to act as Health Officer, Simla, with effect from the date on which he assumes charge of his duties.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BISEDIA

A combination of Schacht's Bismuth and Pepsina Liquida with Sedatives.

Indicated in

Acute Dyspepsia
Gastric Ulceration
Vomiting of Pregnancy
Gastric Hyperasthenia

DOSE.—One drachm in a little water just before meals.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
Bristol, England.

BISMUTHUM CRYST.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

for sleeplessness and pain

remember that Allonal "Roche" is now the most widely used non-narcotic remedy. Allonal has greatly decreased the use of narcotics—opiates and the older hypnotics. Besides allaying nervousness, fear and restlessness, and inducing refreshing sleep, Allonal alleviates pain. It has been used with success in cases where regular administration of morphine over long periods had previously been the only effective treatment.

SAFE :: QUICK :: EFFECTIVE :: NON-NARCOTIC

SEDATIVE :: ANALGESIC :: HYPNOTIC

Allonal 'Roche'

is especially indicated and highly serviceable in:

Insomnia	Neuralgia	Migraine
Nervousness	Headache	Carcinoma
Psychoses	Sciatica	Hiccough
Menopause	Neuritis	Sea-sickness
Dysmenorrhoea	Arthritis	Alcoholism
Dental pains	Tabes	Drug addiction

Pre- and post-operative pain
Vomiting of pregnancy

F. Hoffmann-La Roche & Co., Ltd.

Manufacturers of

Digalen "Roche," the standardised cardiotonic—Omnopon "Roche," the total opium alkaloid preparation—Sirolin and Thiocol "Roche," the safe, efficient remedies for respiratory diseases—and other high-class specialities and fine chemicals.

Roche Agents in India:

Volkart Bros.

P. O. Box 606, Calcutta
P. O. Box 22, Karachi
P. O. Box 199, Bombay
P. O. Box 45, Madras

Stockists for Bengal, Bihar & Orissa, Assam, U. P. and Delhi:
Messrs. A. K. FAZAL & CO.,
80|7, Colootola Street, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Major M. G. Bhandari, I.M.S., on return to duty in the Bombay Presidency, to be Superintendent and Medical Officer, Ahmedabad Central Prison.

Major B. Z. Shah, M.R.C.S. (Eng.), L.R.C.P. (Lond.), I.M.S., Officiating Civil Surgeon, Nasik, is appointed Civil Surgeon, Belgaum, on relief by Lieut.-Colonel K. G. Gharpurey, I.M.S.

His Excellency the Governor of Bombay is pleased to make the following appointment on his Personal Staff with effect from the afternoon of 8th December, 1928:—

Major D. C. Scott, O.B.E., R.A.M.C., to be Surgeon.

Major R. M. Kharegat, I.M.S., Medical Officer and ex-Officio Vice-Consul, Sistan, on return from leave, resumed charge of his appointment with effect from the 12th December, 1928.

Major C. M. Plumptre, M.R.C.S. (Eng.), L.R.C.P. (Lond.), F.R.C.S.E., I.M.S., to officiate as Presidency Surgeon, Bombay, and Physician on the staff at St. George's Hospital, and Marine Surgeon, and in Medical charge of House of Correction, Byculla, and Arthur Road Jail, Bombay, vice Lieut.-Colonel A. N. Thomas, D.S.O., M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), I.M.S., proceeding on leave.

The services of Captain R. N. Bhandari, I.M.S., are placed temporarily at the disposal of the Government of the United Provinces for employment in the Jail Department with effect from the date on which he assumes charge of his duties.

The services of Captain C. L. Pasricha, M.B., I.M.S., are placed temporarily at the disposal of the Government of Bengal with effect from the date on which he assumes charge of his duties in civil employ in that province.

LEAVE.

Major-General R. W. Anthony, M.B., C.M., F.R.C.S.E., I.M.S., Surgeon-General with the Government of Bombay, is granted leave on average pay for two months and three days combined with leave on half average pay for five months and twenty-eight days with effect from the 4th March, 1929, or any subsequent date from which he may avail himself of it.

Colonel R. F. Baird, I.M.S., Inspector-General of Civil Hospitals, United Provinces, leave for six months and five days, with effect from 11th March, 1929.

Colonel G. Hutcheson, M.B., I.M.S., Inspector-General of Civil Hospitals and Prisons, Assam, is granted leave for five months and three days combined with leave for two months and twenty-seven days, with effect from the 1st April, 1929, or any subsequent date from which he may avail himself of it.

Lieut.-Colonel S. S. Vazifdar, I.M.S., Superintendent, J. J. Hospital, Bombay, is granted leave for eight months with effect from the 15th April, 1929, or date of availing.

Lieut.-Colonel H. Stott, I.M.S., Professor of Pathology, King George's Medical College, Lucknow, leave for three months with effect from 1st August, 1929, in continuation of the three months' College vacation commencing from 1st May, 1929.

Lieut.-Colonel J. Cunningham, C.I.E., M.D., I.M.S., Offg. Director, Central Research Institute, Kasauli, is granted leave for 8 months with effect from the 1st February, 1929.

PROMOTIONS.

Lieut.-Colonel F. P. Mackie, O.B.E., M.D., F.R.C.P., F.R.C.S., D.P.H., I.M.S., is appointed to officiate as Surgeon-General with the Government of Bombay during the absence of Major-General Anthony.

CAPTAIN TO BE MAJOR.

Harold Williamson, O.B.E., M.D., F.R.C.S.E., 17th December, 1928.

The provisional promotion of the undermentioned officer to the rank of Captain as notified in the Army Department Notification No. 84, dated the 29th January, 1926, is confirmed, subject to His Majesty's approval:—

Cornellius Vincent Falvey.

RETIREMENTS.

Lieut.-Colonel J. Masson, I.M.S., dated 10th November, 1928.

Lieut.-Colonel M. Corry, M.B., dated 10th November, 1928.

Lieut.-Colonel J. B. D. Hunter, O.B.E., M.B., F.R.C.S.E., dated 12th December, 1928.

NOTES.

ALL-INDIA MEDICAL LICENTIATES CONFERENCE, MARCH, 1929.

IT is notified that an Exhibition in Indigenous Drugs, Scientific and Sanitary Sections, Maternity and Infant Welfare is to be held at Lahore during the third week of March, 1929, in connection with the All-India Licentiates Conference.

ULTRA-VIOLET RAY IRRADIATION.

THE experimental studies showing the effect of the ultra-violet sun rays from the mercury quartz lamp have been very extensive in the last few years, and have added greatly to our knowledge of rickets and allied diseases.

Hess in his experiments with many food substances is of opinion that when these are exposed to the quartz lamp, they become protective against rickets. Milk, flour, spinach, lettuce, vegetable oils, etc., have been successfully activated by irradiation. He also proved that cholestrol, which is normally present in large quantities in the skin, is susceptible to activation, and becomes a depot for storing anti-rachitic substances.

Mellanby has suggested that the anti-rachitic effect from ultra-violet radiation of food results either from an increased vitamin content, or that vitamin becomes more active.

Schabad and Telfer have found that phosphorus and calcium play an important part in the metabolic function, and that the metabolism is influenced by the giving of cod-liver oil, causing the phosphorus in the blood to become increased in rickets, and the calcium in tetany, and that the phosphorus is increased by ultra-violet radiation.

Green-Armytage in his original article on osteomalacia, appearing in the *Indian Medical Gazette* of July, 1928, has proved by his experiments on animals that cholestrol, which is one of the unsaponifiable fractions of cod-liver oil, if irradiated, becomes anti-rachitic. Rats and dogs fed on irradiated cholestrol develop normally, while those fed with the same substance which has not been exposed to the ultra-violet rays develop rickets.

To those interested, particulars can be obtained from Messrs. Smith, Stanistreet and Company, Limited, Calcutta, who have special arrangements for irradiating food substances, including cod-liver oil and cholestrol, by the mercury quartz lamp.

THE 35TH CHEMISTS' EXHIBITION.

THE Exhibition organised by the "British and Colonial Pharmacist" was established in 1896 in London. It is one of the largest, if not the largest, and most comprehensive exhibitions of its kind in the world.

It was organised to give the practising pharmacist an opportunity every year of seeing, under one roof, all the goods he sells and the various apparatus, utensils and other requisites he uses in his profession. The management is always delighted to welcome visitors from the dominions and colonies, and such gentlemen

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

will be admitted on presentation of business card. The Exhibition has grown continuously and this year will be housed from 27th to 31st May, in the new Hall of the Royal Horticultural Society, Westminister, S. W. in the very heart of London, practically under the shadow of the Houses of Parliament and Westminster Abbey.

A CATALOGUE OF THE PUBLICATIONS OF BAILLIÈRE, TINDALL AND COX.

WE have just received a copy of the latest catalogue dealing with publications in Medicine and Allied Sciences issued by Messrs. Baillière, Tindall and Cox, 7 and 8, Henrietta Street, Covent Garden, London, W. C. 2. The book is divided into four sections dealing, respectively, with (*i*) medicine (including dentistry and nursing), (*ii*) foods and food inspection, botany and agriculture, (*iii*) science and miscellaneous, and (*iv*) periodicals and reports.

All the latest productions of this well-known publishing house are listed and an index facilitates ready reference.

CALMETTE'S TUBERCULIN PROTECTIVE VACCINE.

Deutsche Medizinische Wochenschrift, No. 45, page 1,871.

B. C. G.

Schlossmann, Dusseldorf.

CONFERENCE of experts of the Hygiene Section of the League of Nations on Calmette's special tuberculin protective vaccine. (Paris 15—18th October, 1928.)

The committee of experts of the Hygiene Section of the League of Nations met in Paris on 15th October, 1928. The meeting lasting until 18th October, 1928, to discuss Calmette B. C. G. The conference was composed of the three sub-committees, namely, bacteriological, veterinary and clinical. The bacteriological sub-committee was uniformly of opinion that B. C. G. was an innocuous vaccine. The sub-committee of veterinary surgeons was also convinced that the vaccine was not an injurious one. The clinical sub-committee to which Schlossmann belonged came to the following decision: "It can be inferred from the available material that the administration of B. C. G. (1) to infants who have been fed on B. C. G. culture during the first ten days of life, and (2) to infants, children and adults who have had B. C. G. culture given to them subcutaneously, does not at any time give rise to a definite virulent case of tuberculosis. The protective vaccine brings about a certain degree of immunity to tuberculosis."

Schlossmann did not consider that the protective power of the serum was very great. The whole question awaits further research. There will be a second meeting on this subject in 1929.

WATSON'S *MICROSCOPE RECORD.*

THE September 1928 number of Watson's *Microscope Record,* which has just come to hand, contains as usual several features of interest to microscopists.

Under the heading of current microscopy, the technique of photomicrography with special reference to development of the negative is considered. A. A. C. Eliot Merlin has a useful article on "Hints to Beginners," while the Rev. Dingley P. Fuge has a short note on the diatom *Navicula viridis.* There is a description of the new circuit stage van Heurck microscope—an instrument which will appeal more especially to the expert.

The design of this microscope is on lines familiar to Watson microscopists. The tripod foot is wide and massive, ensuring the most rigid and steady support. This foot is shaped to allow easy manipulation of the illuminating apparatus at any inclination. The instrument is supported by the tripod so that it is well balanced in all positions. The coarse adjustment is most carefully constructed and fitted, and permits rapid and exact focussing with high powers. The fine adjustment is by long lever and screw, a combination which is recognized as the very best that is made. The stage is firmly supported and is capable of complete rotation. Its rectangular motions are effected by a mechanism which long experience has shown to be reliable and responsive.

The substage has coarse and fine adjustments to enable modern illuminating devices to be employed with the greatest exactitude.

The body is large and is provided with two draw-tubes, one operated by rack and pinion, to facilitate exact adjustment of the tube length.

Whether used for critical observation or for the most difficult photomicrography, for exact micrometry or for the most precise investigations for which the microscope can be employed, Watson's Circuit Stage Van Heurck Microscope will be found fully equal to every requirement. For those who are not so exacting, but wish to have an instrument which offers every advantage for easy and comfortable manipulation, this instrument is offered as a *modèle de luxe.*

BENGAL CHEMICAL AND PHARMACEUTICAL WORKS, LTD.

MESSRS. The Bengal Chemical and Pharmaceutical Works, Ltd., Calcutta, advise us that they have made complete arrangements for the physiological standardisation of drugs. All preparations of drugs such as digitalis, strophanthus, squills, ergot, cannabis indica, aconite, etc., are standardised by carefully observing their physiological action on animals. The importance of physiological standardisation cannot be over-estimated: it is an absolute necessity for drugs whose activity cannot be estimated by chemical methods. They have a well-equipped laboratory under the charge of expert medical men for carrying out such tests and the most up-to-date methods of standardisation have been adopted. No batch of any preparation is issued before its strength is adjusted physiologically and a certificate of activity is obtained. All preparations are made in strict conformity with the requirements laid down in the British Pharmacopœia, and only carefully selected drugs are used.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis,* if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette,* c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 *including postage, in India. Rs.* 18 *including postage, abroad.*

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

ON A RECENT OUTBREAK OF EPIDEMIC DROPSY IN THE DISTRICT OF BIRBHUM.

BY KALI GATI BANERJEE, M.B.,
Birbhum.

BEFORE giving details of the clinical types of epidemic dropsy observed in the recent epidemic in Birbhum, it may be pointed out that the source of the infection this year (1928) was certainly not "rice" at all. During October, November and December, 1928 the writer saw a hundred cases of beriberi in this district, and, as the evidence in this report will show,—

(*i*) The victims purchased rice from different sources.

(*ii*) Most of them used rice from their own houses and granaries, which were well protected from rain.

(*iii*) In one house the head of the family used sun-baked rice (*atap*), while the rest of the family were in the habit of using ordinary rice; yet the head of the family as well as some of its members went down simultaneously with the disease.

(*iv*) Rice from some of the infected houses was taken and stained with iodine. In every instance the absence of a uniform blue stain showed that the rice was under-milled, and the pericarp was present and not absent (*vide* Tice's *Medicine*—article on beriberi).

We do not know whether the spore-forming bacillus of *B. vulgatus* type, which has been demonstrated in infected rice by Acton and Chopra, and which is said to produce a water-soluble toxin and a neurotoxin, responsible respectively for epidemic dropsy and beriberi, can be found in any food-stuffs other than rice. But the recent epidemic in Birbhum was certainly due to the use of oil; whether the oil was infected with this bacillus or not, I cannot say, but am trying to find out.

The following facts with regard to the recent epidemic are evidence against the infected rice theory of the causation of epidemic dropsy put forward by Acton and Chopra:—

(*i*) The recent epidemic occurred during the winter months. Hence the view put forward by Acton and Chopra, based on the June, 1926 epidemic in Calcutta that cases are especially apt to occur during the rains, and that the incidence of the disease is liable to increase two to three weeks after exceptionally heavy rain, damaging the rice supplies, can be challenged.

(*ii*) Suri, and the villages of Lokpara, Vegabatipur, Kardidhya, all obtained their oil supplies from merchants in Sainthia,—the first village to become infected.

(*iii*) A grog merchant (J in the table) in Suri was attacked, whilst at the same time several families who were supplied from this shop were also attacked. These, however, used rice from their own homes, and not rice from the grog merchant's shop.

Possibly the causative bacillus can be cultivated from the oil used by the victims, and the outbreak had avitaminosis as its predisposing factor.

The following tests are useful in diagnosing the disease:—

(*i*) Reflexes. The majority of cases had lost the knee-jerk. In others it was altered. This is one of the surest tests for the disease.

(*ii*) Anæsthetic points were found in a few cases over the anterior surface of the tibiæ. This test, however, is only occasionally positive.

(*iii*) Every patient felt intense pain when the calf muscles were squeezed. This "squeezing test" is most characteristic of the disease.

(*iv*) Squatting test. The patients are asked to squat on their heels in oriental fashion; then to stand up straight.

In some cases of the disease they are unable to stand up from the squatting position. I obtained only a few positive results with this test; possibly because the cases which I saw were early ones, which had not developed the great weakness characteristic of the later phases of the disease.

Clinical Types.

The different clinical types of the disease seen in the outbreak were as follows:—

(*i*) Febrile cases. In these fever generally sets in two or three days after the onset of œdema of the legs; the temperature being between 99° and 101°F. Fever generally subsided towards evening. Its presence did not seem to affect the prognosis in any way.

(*ii*) Dry cases. Only one such case was seen. The patient had paresis of both legs, and pain in the calves was very marked.

(*iii*) Gastro-intestinal type. About three-quarters of the cases started with diarrhœa, indigestion, nausea and vomiting; or else complained of bowel trouble. This was preceded by œdema of the feet.

(*iv*) Fulminating or cardiac cases. These cases were few. One of them had no œdema, but showed great dilatation of the heart. One schoolboy, a victim to the disease, died on the 7th day of illness from acute cardiac dilatation.

(*v*) Simple cases. These showed only œdema of the legs, most marked towards evening. They were generally able to carry on their duties, but a few such cases passed into one or other of the severer types described above.

The following were peculiar features of the outbreak:—

(*i*) Low blood-pressure and hypo-adrenia were not associated with it. Some of the patients (notably 0 in the table) had high blood-pressure, associated with almost total renal

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

failure. A certain degree of renal failure was a marked characteristic of most of the cases.

(*ii*) Cardiac dilatation, though marked in a few instances, was not a characteristic feature of the outbreak.

(*iii*) Atony of the intestine was present in only a few instances. Attention to this symptom was drawn in the Calcutta outbreak of 1926, and perhaps its absence in the Birbhum epidemic accounts for the lessened mortality as compared with the Calcutta figures.

(*iv*) In most patients the knee-jerks were lost or modified.

(*v*) In all the "squeezing test," applied to the calves, was positive.

(*vi*) All the patients appeared to have derived the infection from other sources than rice—probably from mustard oil.

(*vii*) Very few showed pigmentation of the face,—the sign of hypo-adrenia.

Treatment.

The treatment adopted was mostly dietetic. Victims of the disease, and also persons residing in the affected area, were instructed to take the following foods; germinating gram; oranges; lemons; tomatoes; raw onion leaves; cabbage leaves; unboiled milk; eggs—quarter boiled; molasses; yeast, from the date palm (palmyra tree); bread; *khichuri*, i.e., a mixture of rice and whole grain *mung* or *mossuric* boiled together; beans.

Medicinal treatment.

The following were used:—

(*i*) Beemax; one teaspoonful b.d. or t.d.s.; or Marmite in gr. 20 doses t.d.s.

(*ii*) Yeast-vimal; half a teaspoonful in hot water, was prescribed to some.

(*iii*) Metatone (P. D. & Co.). Two teaspoonfuls t.d.s. to neurotic and rich patients, and as an after-tonic to some others.

(*iv*) As a general cardiac and diuretic tonic, the following general prescription was administered (with or without modifications) to all patients.

℞

Collosal calcium (Crooks' oral)	..	1 dr.
Extract punarnava liquidum	..	1 dr.
Extract arjun liquidum	..	1 dr.
Tinct. digitalis (P. D. & Co.)	..	m. 10
Liquor ammoniæ acetatis		
Liquor ammoniæ citratis	aa	1 dr.
Syrupi		
Aquam	aa	oz. 1

oz. i. t.d.s.

(*v*) Liquor adrenalin hydrochloridi, 1:1,000; in 3-minim doses b.d. was given to some patients.

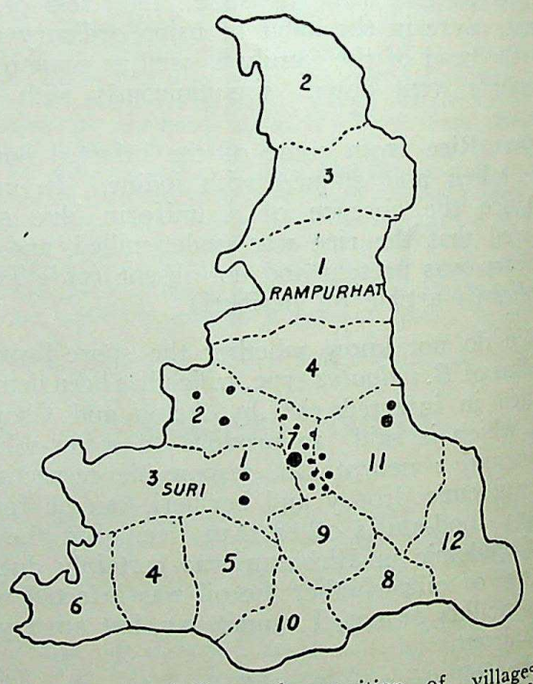
(*vi*) Syrup hæmogen with vitamine extract or liver extract (B. I. Co.) was prescribed in some cases to combat anæmia and asthenia.

The attached table gives details of 28 cases studied.

EPIDEMIC DROPSY IN BIRBHUM.

By U. GHOSH, M.B. (Cal.), D.P.H., D.T.M. (Bengal),
District Health Officer, Birbhum.

History.—During the middle of November, 1928, I was called in to the house of a local medical practitioner and friend of mine residing in Suri in this district, to see some members of his family suffering from œdema of the feet. I found that 8 out of the 11 members of the household were affected, including a compounder who used to take his breakfast and afternoon tea at this particular house. The rice used by the family was the parboiled and home-husked variety. The mustard oil used came from a local shop, the owner of which used to buy it at Sainthia, a junction station on the E. I. R. loop, 11 miles from Suri. At this station there is only one oil mill, and it is owned by a Marwari gentleman. On the occurrence of subsequent cases in other families in Suri, enquiries were made, and it was found that the mustard oil which they used all came from the same shop in Suri. Later, it was found that some 30 cases had occurred in Sainthia, confined to some 8 or



Black spots indicate the position of villages affected with epidemic dropsy in November and December, 1928.

Rampurhat Subdivision:
1. Rampurhat Thana.
2. Murarai Thana.
3. Nalhati Thana.
4. Moureswar Thana.

Suri (Sadar) Subdivision:
1. Suri Thana.
2. Md. Bazar Thana.
3. Rajnagar.
4 & 5. Dubrajpur.
6. Khoirasole.
7 & 9. Sainthia.
8. Bolpur.
10. Illambazar.
11. Labpur.
12. Nanur.

9 families; this was followed by reports of outbreaks in some 8 or 9 villages around Sainthia. The distribution of the disease is shown in the attached map.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

TABLE.

List of infected persons.

Name.	Age.	Sex and nationality.	Clinical Features.							Source of rice, oil, etc.	Number of infections in the house.	Remarks and Result.
			Œdema.	Condition of Heart.	Urine.	Blood-pressure.	Bowels.	Reflexes.	Fever and other symptoms.			
A.	29	H.M.	Œdema of legs which diminishes in the morning.	Pulse 92. Position apex in the 6th space in the mammary line. 1st sound muffled and equal spacing of both sounds.	Amount small.	110	Regular.	Knee jerks diminished.	*Nil*, but pain in calves and restlessness at night.	Rice—"home" but not stored from beforehand. Oil from Sainthia.	*Nil.*	Cured.
B.	45	H.M.	Œdema of legs.	Nothing abnormal	No trouble.	130	There was intense diarrhœa and occasional vomiting before the onset of œdema.	No abnormality.	*Nil.*	Rice—Sun dried (Attap) Oil—from a grog-shop which imported oil from Sainthia, the grog-shop-keeper himself being infected.	6 (5 others took a kind of rice different from his).	Not yet cured.
C.	25	H.M.	,,	Equal spacing of two heart sounds.	,,	..	,,	,,	*Nil.*	..	Servant of B.	,,
D.	30	H.M.	,,	..	,,	..	(1) There was diarrhœa after the œdema subsided.	,,	Pain in shoulder and back after œdema, and diarrhœa have subsided	..	Compounder of B. (B, being medical practitioner)	Cured.
E.	13	H.M.	,,	..	,,	..	..	Knee jerks diminished.	*Nil.*	..	Son of B.	,,
F.	10	H.F. (child)	,,	..	,,	..	..	No abnormality.	*Nil.*	..	Daughter of B.	,,
G.	17	H.M.	,,	..	,,	..	..	,,	*Nil.*	..	Son of B.	,,
H.	36	H.F.	Swelling of legs and face.	(1) Cough, (2) Heart dilated systolic murmur. Pulse 102. Respiration 42.	Scanty urine.	100	(1) Constipation. (2) Tympanites.	Knee jerks diminished.	*Nil.*	Rice—from his own house. Oil—from the shop which supplied B.	"2"	,,
I.	48	M.M.	Swelling of legs.	..	..	..	..	,,	*Nil.*	..	Husband of H.	..
J.	40	H.M.	Œdema of legs for 1½ months.	No change.	Scanty urine.	..	Diarrhœa.	,,	*Nil.*	Rice—from home. Oil—from Sainthia.	The infected person is the grog shop-keeper who supplies oil to everybody from B to I.	Not yet cured.
K.	38	M.M.	Œdema of legs for a fortnight.	,,	,,	..	..	,,	*Nil.*	Rice—from J's house. Oil—from J's shop.	*Nil.*	Cured.
L.	30	H.F.	Œdema of legs, for a week only.	,,	..	..	Diarrhœa.	Reflexes knee jerks absent.	Fever ++ Pain in calves.	Rice—"home". Oil—from J's shop.	*Nil.*	,,
M.	30	H.M.	Œdema of legs which lasted for 8 days.	,,	..	..	..	*Nil.*	,,	,,	2	,,
N.	38	H.F.	,,	,,	..	..	..	..		,,	Sister to M.	,,
O.	40	H.M.	Œdema of both legs.	,,	..	130	..	Reflexes normal.	..	..	..	,,
P.	34	M.M.	Œdema of legs and scrotum.	Heart dilated (1) Apex in mammary line in the 5th space. (2) Equal spacing of two heart sounds.	Scanty urine and it contains no albumen.	120	..	Knee jerks absent.	(1) Giddiness. (2) *Pigmentation of face.* (3) Watering of eyes.	Rice—home. Oil—from Sainthia.	..	Not yet cured.
Q.	14	H.F.	(1) Œdema of both legs. (2) Œdema of face.	Pulse 100. (1) Irregularity of pulse. (2) Equal spacing of two heart sounds.	Scanty.	145 m.m.	Constipation was marked.	Reflexes exaggerated.	..	,,	*Nil.*	Cured.
R.	33	M.M.	Œdema of legs.	Equal spacing of two heart sounds.	No change	.	..	No change.	..	..	Servant of P.	,,
S.	30	M.M.	(1) Œdema of legs.	Pulse 92. No other change.	,,	..	Diarrhœa.	Reflexes knee jerks absent.	..	..	,,	,,
T.	40	M.F.	Œdema of legs.	Heart dilated. Pulse 92.	,,	130 m.m.	..	,,	..	Oil—from Sainthia.	2 Wife of U.	,,
U.	50	M.M.	,,	..	,,	140 m.m.	..	Knee jerks absent.	..	,,	Husband of T.	,,
V.	32	H.M.	,,	..	,,	..	..	..	..	..	2	,,
W.	20	H.F.	,,	..	,	..	..	..	..	..	Wife of V.	,,
X.	32	H.M.	,,	..	,,	..	..	Knee-jerks++.	(1) Fever every afternoon. (2) Pain in epigastrium.	..	..	,,
Y.	12	H.M.	,,	Apex ½ inch outside the nipple line.	,,	..	Constipation.	Knee jerks absent.	(1) Fever in the evening. (2) Headache. Spleen ++.	..	..	Not yet cured.
Z.	42	H.M.	,,	(1) Palpitation.	Scanty.	..	Diarrhœa.	..	*Pigmentation of face.*	..	..	,,
1.	22	H.M.	No œdema.	(1) Shortness of breath on exertion. (2) Palpitation. (3) Cough. (4) Dilatation of heart. (5) Equal spacing of two sounds.	,,	110	Constipation.	..	..	..	..	,,
2.	28	M.M.	,,	..	,,	..	Dysentery beforehand.	Knee jerks absent.	(1) Pain in both the legs. (2) Paresis of 2 legs. (3) Inability to walk.	..	..	,,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Causes.—(*i*) *Diseased Rice.*—Was this outbreak due to the consumption of diseased rice, which Acton and Chopra believe to be the cause of epidemic dropsy? In no case that occurred was milled rice used; on the contrary, in two families which were affected the home-husked variety without parboiling (*atap*) was used. The variety of rice used was in no instance more than one year in storage, and had been stored in the specially prepared and covered godown in the open space of the compound near the house.

(*ii*) *Vitamin Deficiency.*—In all cases enquired into, although it was found that there was a lack of intake of fruits or fresh vegetables (raw) in the diet, or a deficient intake of milk, yet this could not account for the epidemic, since other persons on the same diet did not contract the disease. Further, the deficiency in intake of fresh vegetables and milk is permanent among the individuals concerned, yet they did not develop epidemic dropsy previously. The theory that the persons affected were on the border line of vitamin deficiency, and that some other external or internal cause or causes precipitated the outbreak, does not seem to be tenable.

(*iii*) *Mustard oil.*—In one family at Bhagatipur it was reported that they had mixed raw mustard oil thoroughly with 3 seers of fresh goat flesh; had kept it aside for two hours, and then cooked and eaten it. Ten members of the family partook of this meal, including menials; during the night they were affected by purging and vomiting; some later developed œdema of the legs; cardiac distress ensued in one patient; and extreme weakness in others within four or five days. On making enquiries at Sainthia railway station, I learnt that the owner of the oil-mill some four months previously or so had imported 4 or 5 wagon loads of a particular seed resembling *pakra* seeds through a foreign railway. There is also another variety of seed grown locally which resembles mustard seed; it is known by the local name of *kaur* thorn seed, and yields oil on pressure. It grows wild in the jungles and does not require any special attention in cultivation. I have heard from a local man that these seeds are sometimes mixed with mustard seeds, and possibly they may be responsible for the epidemic.

Conclusion.—The consensus of opinion amongst local medical practitioners is that it was a particular batch or consignment of mustard oil which was the cause of this outbreak, and that subsequent consignments were not adulterated. That the outbreak was not due solely to deficiency of vitamin B is shown by the explosive character of the outbreak; the deficiency in vitamin B is applicable to almost all persons living in the locality, and the results of it would only have developed slowly. The rice infection theory is also not tenable, because in every instance the rice used came from the family store, and not from a common source.

TABLE.

Ingredients used for extraction of "Mustard" oil, and their prices.

	Black variety, per maund.	Yellow variety, per maund.	
1. Mustard	7-8 to 8-8	9-0 to 9-8	Cakes 3-6 without bag.
2. Soorgoocha	7-4 to 7-8	.....	Used when cheap; otherwise Sorgooj.
3. Posta	13-0 to 15-0	.....	
4. Ground nut	6-8 to 7-0	.....	Used when cheap; otherwise Sorgoocha cakes are good.
5. Til	8-0 to 8-8	.....	
6. Linseed.	Not known.		
7. Pakra.	Not known.		
8. Kaur thorn seeds.	Not known.		

INDIAN DIETARIES IN THE UNITED PROVINCES.

By NIANT DHAN BANERJI,

Research Worker, Physiology Department, King George's Medical College, Lucknow.

THE object which this enquiry dealt with were to ascertain, as far as possible, with regard to the dietaries actually in use in the United Provinces—

(*i*) their average nutritive values.

(*ii*) whether full monetary value is obtained for the money spent on the different articles of diet.

(*iii*) whether the diets concerned are suitable for the particular classes of persons who consume them; and, if not,

(*iv*) what should be the approximate changes in each class.

[*Note.*—As Dr. C. S. Thakur, F.C.P.S., L.M.S., Professor of Physiology, King George's Medical College, Lucknow, is of opinion that the average Indian diet is not lacking in vitamines, the vitamine aspect is not raised in this paper (1).]

The actual diets to be considered are as follows:—

(*A*) *Average Vegetarian Diet.*

Morning.
- Sugar ½ chatak.
- Milk 1 chatak.
- Atta 1½ chataks.
- Tea ½ chatak in the 24 hours.
- Butter ½ chatak in the 24 hours.

Midday.
- Wheat atta-rice 2½ to 3 chataks.
- Pulses 1 to 2 chataks.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Vegetables 3 to 4 chataks.
Ghee 1 to 1½ chataks.
Milk 2 to 3 chataks.
Sugar ¼ chatak.

Afternoon.
Sugar ¾ chatak.
Milk 1 chatak.
Atta ¼ to ½ chatak.
Fruits, dry or fresh.

Dinner.
Nearly the same as the midday meal, except that milk is consumed in larger quantities, i.e., about 8 chataks.

(B) Average Mixed Diet.

Morning.
Atta is less than in the previous diet, i.e., ½ to ¾ chataks.

Eggs 1 or 2.

Other articles as in Diet A.

Midday.
Fish or meat is added 1 to 2 chataks.
Pulses only ½ chatak.
Other articles as in Diet A.

Afternoon.
As in Diet A.

Dinner.
Nearly the same as the midday meal, but extra milk is consumed up to 8 chataks.

(C) Average Agricultural Vegetarian Diet.

Morning.
Gur ½ to 1 chatak.

Midday.
Atta (*bajra* and *juar*) 4 chataks.
Pulses 1 chatak.
Vegetables 1 chatak.

Dinner.
Atta (*bajra* and *juar*) 4 chataks.
Pulses 1 chatak.
Vegetables 1 chatak.

(D) Average Agricultural Mixed Diet.

Morning.
Same as C.

Midday.
Pulses ½ chatak.
Meat, fish, or eggs 1½ to 2 chataks occasionally.
Other articles as in Diet C.

Dinner.
Same as C.

(E) Mahomedan Mixed Diet.

Same as Diet B, except that the extra 8 chataks of milk are not generally consumed; instead eggs enter more into the dietary, say 2 extra eggs per day being consumed in addition to the dietary given in B above.

(F) Mahomedan Agricultural Diet.

This is the same as for his Hindu brother living on a mixed diet. I have noticed in the United Provinces and Bengal—and the same may be true of other Provinces that, generally speaking, the diets of the labouring classes of the population—especially agricultural classes—do not differ much as between Hindu and Mahomedan, but the reverse is the case with the higher caste, well-to-do classes.

Now, when it comes to comparing the protein, fat, and carbohydrate ratios in the above diets, we may draw the following observations (*vide* Table I).

TABLE I.

Comparison of diets expressed in Grams.

Class of person.	Proteins.	Fats.	Carbo-hydrates.
1. Professional man (mixed diet) Indian U.P.	117*	159	442
2. Ditto. U.S.A	110	136	442
3. Well-to-do people Bengal.	100	150	400
4. McCay's Bengali students (7).	67*	71	548
5. McCay's Anglo-Indian	94	56	467
6. U.P. Cultivator, average.	65	19	363
7. U.P. Prisoner (McCay)	84	10	348
8. Bengal ,, ,,	52	25	475
9. U.S.A. Farmer ...	101	128	476
10. Average Londoner (6)	98	60	416
11. Brickmakers, Cambridge, Mass(4).	180	365	1695
12. Voit (4)	145	100	450
13. Rubne	165	70	565
14. Playfair	185	71	568
15. Atwater	150	150	500

* The high protein value is due to vegetable proteins mostly.

A. Vegetarian Diet.

This class is consuming a useless excess of carbohydrates at the expense of proteins. One should not be led astray by the high figure given for proteins in Table I. This high figure is due to the presence of pulses (legumes) in the diet; these have a low digestibility in the human system, and—further—such indigestible proteins form a splendid culture medium for the growth of putrefactive micro-organisms. In addition to this, microscopical examination of the fæces has shown that there is a great loss of protein absorption when inferior vegetable foodstuffs are taken in(2). From observations carried out by Colonel McCay it would appear that the dal granule is the most difficult of all to break down, and that the slightest lowering of the general health is accompanied by the passage of indigested dal(3), and hence such foods are of little use in metabolism. Further, the presence of such indigestible vegetable protein residues increases the bulk of the fæces and causes disturbance of the normal digestive function by causing fermentation. The question of improving this particular diet under discussion is of great importance from an economical and sociological point of view. Our Indian leaders of thought and pioneers and intellectuals are apt to be cut off in their prime by the ravages of that canker of the intellectuals—diabetes mellitus.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

One of our teachers, who has a very extensive experience of conditions in the United Provinces, is wont to impress on our minds that diabetes mellitus year by year saps the energies of a very large percentage of the judicial officers in these Provinces. One method of improving this dietary—in my opinion—would be to increase the proportion of digestible proteins by the addition of preparations of milk—such as cheese, and particularly *chana* (so extensively used in the sweetmeats of Bengal), or *mawa* as it is known in the United Provinces. It is not necessary that this should be taken in the form of sweetmeats, for it can be used in the preparation of *pulaos* and of vegetables. Some Hindu families believe it to be a sin to coagulate milk by the use of rennet, or any similar ferment; but I believe that such families are few in number.

With the larger consumption of this variety of protein, and by slightly increasing the quantity of milk consumed, the carbohydrates in the form of atta and sugar should be cut down. For this class of persons a high carbohydrate value in the diet is not necessary, for the excessive carbohydrate element in the dietary is the source of a very high heat value—a value far higher than that considered necessary for a European living in a much colder climate than that of India. A bulky carbohydrate ration means increased digestive troubles, and the consequent fermentation is a source of loss of potential energy from the diet.(3) If further evidence were required that loss to the body of a very large proportion of the potential energy of the diet takes place by excessive carbohydrate fermentation, it is afforded by the practical absence of any marked tendency to the storing of fat amongst the working population of Bengal.(3)

B. Mixed average diet.

Here we observe that the protein quota is very much less, when compared with the figures of Voit, Rubner, Playfair, and Atwater, even granting that these workers were not dealing with diets under Indian conditions. By further additions in the meat, fish and eggs items, and by cutting down vegetables, the correct ratios may be obtained.

C. Vegetarian Hindu Labourer.

The plight of this class of person is very sad for he is "consuming more than his system can utilise, and more than he would normally consume if the diet were properly constituted. Deficiency diseases result from the absence of some essential element in the diet. Their occurrence is, therefore, no indication of poverty and consequent scarcity of food. "A dietary conducing to mal-nutrition may cost more than a well-balanced dietary which promotes health."(1)

The chief drawback in his diet is that the variety of protein he is consuming is of a very low grade from the point of view of digestibility. The total quantity is small, and the quantity of fat is miserably poor and entirely inadequate. It has been calculated that an addition of 11 grams of fat to the diet enables a man to walk one and one-third miles at a slow rate.(5) To the agriculturist whose labours in the fields entail such expenditure of muscular energy the need of such a quantity of fat in his dietary is paramount. Dr. W. Burridge, Professor of Physiology, King George's Medical College, Lucknow, thinks that a large percentage of the cultivators in India get less to eat than the prisoners. Col. McCay also emphasised this fact in connection with the prisoners of Bengal. For example a prisoner gets wheat atta, while a very large percentage of the cultivators take only *bejer* and *juar* atta, which are much inferior in their nutritive composition. From the accompanying statement, very kindly furnished by the Director of Land Records, United Provinces, it will be evident that wheat is most largely grown, *i.e.*, 17 per cent. of the cropped area of the Province, yet the cultivators cannot consume it and instead consume *bejer*, etc., which is grown only to the extent of 4 per cent. of the total cropped area.

TABLE II.

Statement showing percentages of certain crops on total cropped area for the years 1924—1928, *United Provinces.*

Name of crop.	PERCENTAGE OF TOTAL CROPPED AREA. Years.			
	1924-25.	1925-26.	1926-27.	1927-28.
Juar ..	5	5	6	6
Bajra ..	4	4	5	4
Maize ..	4	4	4	4
Rice ..	16	18	18	17
Wheat ..	17	16	16	17
Barley ..	10	10	9	10
Small Millets, Mandwa, etc.	3	3	4	4
Gram ..	16	16	14	14
Arhar ..	4	3	4	4
Urd* ..				

* *Note.*—Separate figures for this crop are not available.

At present the digestibility of protein in a cereal like wheat is 67.10 per cent.(2). In future years, by a better method of cultivation and by improving the soil, a larger proportion of the protein in the food grains may be made digestible.

Conclusions.

1. The percentage of preventable mal-nutrition in this country is over 10 per cent.

2. There is a close relationship between nutritional problems and agricultural practice and conditions. The food value of the crop from the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

deficiency diseases aspect; the necessity of supplementing a staple food diet by the growth or importation of foodstuffs containing the nutrient substances which the staple food lacks; the resulting necessity for cheap transport; all these are questions in which nutrition and agricultural research are inseparably linked.(1)

3. With a low protein consumption, deficient stamina, moral and physical, must be expected, (confirmed by Colonels McCay and McCarrison).

4. The present decrease in mortality is due mostly to the advances made in sanitary science and better facilities for medical relief, during the last 68 years. A further decrease in death rate is possible only by improving the diet.

5. The methods of cooking need reform, because they have a considerable influence on the digestibility of the nitrogenous constituents of foodstuffs.

6. The money spent on extra consumption of sugar, starchy food, and vegetables should be diverted to the purchase of digestible proteins.

7. "We live not upon what we eat, but upon what we digest."

I take this opportunity of thanking Dr. C. S. Thakur, Professor of Physiology, for his most valuable suggestions, and my grateful thanks are due to Mr. Anrudh Lal Mahendar, Director of Land Records, United Provinces, for giving me every possible help and kindly furnishing me with statements.

REFERENCES.

1. *Royal Commission on Agriculture in Indian Report*, 1928.
2. McCay. *U. P. Jail dietaries.*
3. McCay. *Bengal Jail dietaries.*
4. Hutchison, R. *Food and the Principles of dietetics.*
5. Dubois. *Basal Metabolism.*
6. McKillop, M. *Food Values, what they are: how to calculate them.*
7. McCay. *The Protein Element in Nutrition.*

DETACHMENT OF THE RETINA. A COMPLETE CURE IN A MYOPIC CASE.

By M. D. ANKLESARIA, D.O.M.S., (Eng.), F.C.P.S, (Bomb.), M.R.C.S. (Eng.), L.R.C.P. (Lond,),
Honorary Ophthalmic Surgeon, Civil Hospital, Ahmedabad.

THE pathogenesis of detachment of the retina is very obscure indeed, and this is particularly true for that variety of detachment which is known as primary simple idiopathic or non-traumatic detachment and which includes myopic detachments also. As a result of this, various theories have been formulated from time to time by different observers to explain why the retina gets detached from the choroid, but up to now no single one has succeeded in satisfactorily explaining its causation in the majority of cases. The pathogenesis being so obscure, it is natural that treatment of the condition, whether by medicinal or operative measures, should be equally unsatisfactory and cases of a successful cure resulting therefrom are very rare. The majority of the cases being unaffected by treatment, or improved only temporarily, eventually become completely blind. The occurrence of even a single complete cure in an authentic case, after some definite line of treatment therefore deserves recording.

Detachment of the retina should be looked upon as a sign rather than a disease and may be due to a large variety of essentially different lesions. From a developmental point of view a weak spot exists in the anatomy of the retina. The retina develops from the ocular cup which is produced by an invagination of the apex of the primitive ocular vesicle and the cavity so produced becomes occupied by the lens vesicle. Owing to this invagination the ocular cup becomes bilaminar or composed of two layers. The outer layer is thinner and forms the pigment epithelium of the retina and the inner layer, which is much thicker and which becomes folded back, forms the rest of the layers of the retina, the two layers being everywhere in mere contact with each other, the original cavity of the ocular vesicle though potentially existing being virtually obliterated. The outer layer being reduced to a single layer becomes the pigment epithelium layer of the retina and is closely united to the choroid, while the inner layers are nowhere firmly attached except at the ora serrata and at the optic disc. Between these two attachments the retina and the choroid are merely held together by the tension of the vitreous covered over by the hyaloid membrane and by the inward prolongations of the pigment epithelium in between the rods and the cones. A weak spot thus exists in this inter-retinal space, lying between the pigment epithelium on the one hand and the other layers of the retina including the rods and the cones on the other, and a separation when it occurs, does so at this weak spot, the pigment epithelium still remaining adherent to the choroid and the space between the two being filled by serous fluid.

From a pathological point of view a detachment usually originates in two or three principal ways. In the first place the retina may be either pushed in or pressed away from its bed on the choroid into the vitreous chamber by a force greater than the tension of the vitreous, such as would occur owing to accumulation of fluid in the inter-retinal space from inflammatory conditions of the choroid or the retina, or from a new growth; or, secondly, it may be pulled inside into the vitreous chamber owing to shrinkage of the vitreous in consequence of the pressue exercised by it ceasing to act, owing to the presence in it of fibrous bands or adhesions, or due to cicatricial changes occurring in the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

retina. A third form has also been described by Sir William Lister as due to a hole or holes in the retina, the retina in this case being floated in by the transposition of fluid vitreous through a hole in it. The hole may be attributed to a blow or to cystic degeneration of the retina, or to fibrous bands in the vitreous, or to choroiditis, or it may be idiopathic in nature. Though by no means a satisfactory classification, for all practical purposes detachments of the retina may be divided into two main groups (*a*) *simple primary idiopathic* or non-traumatic detachments, which cannot be attributed to any definite cause or any well-defined or easily recognised lesion, including the myopic ones also; and, (*b*) *secondary or symptomatic* ones due to some definite pathological lesion, local or general. Such cases occurring after large quantities of escape of vitreous due to an injury or an operation, and those due to early stages of an intra-ocular growth come into this category. It may also be due to such local diseases as severe exudative choroiditis or cicatricial changes in the retina, or due to a general uveitis with plenty of exudate in the vitreous or due to hæmorrhages in the vitreous, degenerations and cicatricial bands in the vitreous, which get attached on the retina and subsequently by their contraction pull upon it. Constitutional diseases such as nephritis of various forms, pregnancy, influenza, scarlet fever etc., are held responsible for its occurrence in yet another class of cases. The pathogenesis of this latter group has been fairly well understood. In cases of extensive renal retinitis or retinitis of pregnancy, where the detachment is due to a transudation of fluid from the retinal tissues into the sub-retinal space, the prognosis is not so bad, as with the improvement in the general condition of the patient, following on proper treatment, a corresponding improvement and even disappearance of the detachment has been noticed to occur every now and then. The same is true of some of the traumatic cases, where the detachment is due to a blow causing an exudation in the inter-retinal space which gets absorbed in course of time, and here also the prognosis is not so unfavourable. On the other hand, cases occur in which a rent or a tear occurs in the retina, giving free access of vitreous into the inter-retinal space. In such cases the prognosis is hopeless.

The same cannot be said, however, with regard to cases of the first group, the spontaneous or idiopathic variety of detachment, a fairly large majority of which are myopic detachments and with which we are most concerned at present. This class is usually characterised by the occurrence of the usual prodromata, by the sudden onset, by the absence of any known cause, or any other very definite involvement of other structures in the eye. The pathogenesis of this class is very obscure from the first and the prospects of a successful cure even after treatment of a long and tedious nature are problematical.

Of the various theories that have been put forward to explain the genesis of this form of detachment of the retina perhaps the commonly accepted views are two in number: (1) the exudative theory, subsequently modified by Raehlmann and called the diffusion theory; and (2) the vitreous traction theory of Leber and Nordenson. The former maintains that an exudate forms in the inter-retinal space as a result of an effusion of fluid from the choroidal vessels, this fluid being of a more albuminous character and of higher specific gravity than the fluid of the vitreous. Side by side with this process some degenerative changes occur in the vitreous, probably as a result of deficient secretion from the ciliary body. The normal vitreous loses its jelly-like structure, its supporting framework and the hyaloid membrane covering it shrink, floating opacities develop in it, it becomes more fluid in consistence and the empty space between it and the retina becomes filled with free fluid derived from the ciliary processes. The general lowering of the vitreous tension causes passive hyperæmia in the choroidal vessels and would upset the balance and cause an inter-retinal transudation to form, which would push the retina out of its bed from the choroid inwards, a corresponding escape of fluid vitreous occurring through the anterior chamber and excreted through the filtration angle without any rise in the intra-ocular tension occurring. This theory fails to explain satisfactorily why these exudates and the detachments are more frequently located in the upper part of the fundus than in the lower part, and why the exudation remains localised there to the extent of causing a detachment rather than spreading to the neighbouring parts, and also owing to the rapidity of its formation why the intra-ocular tension does not get increased as one would expect to find in the ordinary course of events. The modified diffusion theory of Raehlmann presupposes three essential conditions; firstly, vitreous of low tonicity, i.e., more fluid than normal; secondly, a choroidal or a retinal lesion giving rise to an inter-retinal exudate of a high albuminous character, higher specific gravity and lesser saline constituents; and, thirdly, an active membrane such as the retina is. What follows as a sequence of the conditions mentioned is that owing to abnormal osmotic pressure in accordance with the laws of diffusion a flow of saline fluid would occur from the higher-content salines contained in the vitreous into the sub-retinal exudate which would swell up the retina and causing pressure upon it would rupture it, that is, a rupture occurs after the retina is detached.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

To understand the occurrence of these events let us recall to mind the series of changes that occur in the eyeball as a result of myopia of fairly high degrees. Detachments occur more readily in myopic eyes than those due to other conditions (Galezowski found that out of 1,158 cases of detachment 918 were in myopic eyes; Uhthoff found that myopia was the cause in 61 per cent. of his series). The cubical capacity of the scleral cavity becomes increased in myopia, due to distension of the posterior pole of the eyeball, when of fairly high degree as from 8 to 12 dioptres and upwards. With this increase there is no corresponding increase in the size or in the growth of the choroid or the retina except by way of stretching or retraction as it occurs round the optic disc, nor is there any corresponding increase or growth of the normal vitreous.

The elongation of the eyeball thus occasioned causes some interference in the natural cohesion existing between the pigment epithelium and the other layers of the retina, giving rise to some stretching and exudation in this inter-retinal space. Consequent upon this and upon nutritional disorders in the uvea, the supporting framework of the vitreous becomes broken down. This causes increased fluidity, secondary degeneration and floating opacities in the vitreous, due to the breaking up of the delicate fibrillæ which form its matrix, and reduces its tonicity below par and so the first essential condition predisposing to a detachment is obtained in myopia. The second essential factor is a sub-retinal exudate which also sometimes results from an equatorial choroiditis, but more frequently in virtually healthy myopic eyes from a venous stasis or from circulatory disturbances in the uvea, to which these eyes are particularly vulnerable. Add on the top of this some form of trauma as sudden physical exertion or fits of coughing, vomiting, lifting of heavy weights, a fall on the body, a blow on the face or the head, or any such condition becoming the exciting cause, may bring about an increase in the venous stasis existing in the eye or in the chorio-capillaries, and it is conceivable how a small sub-retinal exudate or a hæmorrhage may occur, which might eventually lead to a detachment, as explained by Raehlmann. Any local or systemic affection involving the ciliary body or the choroid which are the principal nutrient coats of the eye may further predispose to its occurrence.

The second theory is that of Leber-Nordenson and it is also known as the vitreous traction theory. Its assumption is based on the facts that as a result of chronic inflammatory disorders in the uveal tract exudates form in the vitreous, which loses its normal jelly-like consistence and cause adhesions between the retina and the vitreous at places other than the normal attachments, viz., the optic disc and the ora serrata. The supporting framework or the stroma of the vitreous shrinks along with the hyaloid, fluid accumulates in the meshes of the fibrillæ, these latter also shrink and sub-retinal fluid is found to fill up the gap so caused between the hyaloid and the retina. Later on as a result of shrinkage of the vitreous, the retina is pulled upon either at its normal attachments, i.e., at the optic disc, and at the ora serrata, or the exudates may form false attachments which may be pulled upon and eventually a tear may be caused in it and a detachment may occur. The intra-ocular tension is usually diminished in such cases. This theory presupposes three essential conditions, a degeneration of the vitreous with coarse fibrillation, contraction of the fibrillæ and liquefaction of its substance, pulling upon the retinal or the false attachments; finally, a tear and lastly a detachment may occur. Leber further maintains that the epithelial cells of the pars ciliaris proliferate and may grow into the inner surface of the retina and thence migrate into the vitreous, their passage being facilitated by degenerative changes occurring in it, and the epithelial cells there undergo connective tissue changes and form membranes limited to the inner surface of the retina at its posterior part. These changes cause compression and in course of time condensation of the vitreous, and adhesions between it and the retina may also occur. Later on perforation of the retina may take place due to the traction exerted on it by the contraction of the newly formed membranes, the latter circumstance being aggravated by movements of the eyeball. In myopic eyes it has been found that delicate membranes form on the inner surface of the retina and consequent on the traction exerted on the retina a tear and a detachment may develop. The essential fact common to both these theories is fluidity and degeneration of the vitreous which is a *sine qua non*, for with a healthy vitreous detachment is extremely rare.

Gonin in a valuable contribution presented to La Societe d' Ophthalmologie on the pathogenesis of *idiopathic* detachment of the retina holds views more or less similar to those held by Leber. He maintains that a tear or a rupture in the retina is a more common occurrence than it is supposed to be, and that the detachment is essentially due to a contraction of the vitreous owing to the presence in it of strands of epithelial cells undergoing proliferation and connective tissue changes, and not to newly formed membranes on the inner surface of the retina as explained by Leber. The way in which this is brought about is explained by supposing that owing to nutritional disorders in the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

anterior uvea an atrophy of the ciliary body occurs, its epithelial cells proliferate and migrate into the vitreous, their passage being facilitated by degenerative changes occurring in it and there they undergo connective tissue changes which cause condensation of the vitreous and adhesions between it and the retina. A perforation of the latter occurs, due to the traction exerted on it, and aggravated by movements of the eyeball. As an exciting cause a sudden blow on the face or a jerk or some sudden physical exertion may so displace the intra-ocular contents that the traction may be aggravated and eventually a tear may occur. Myopic eyes are more vulnerable to such circulatory disturbances in the anterior uvea and are thus predisposed. Gonin further explains certain peculiarities which occur, however, with regard to the origin, the onset and the appearances of a detachment. The onset is as a rule sudden, but there may be some prodromata such as floating spots or photopsæ, flickering of light, or sparks in front of the eye or some form of metamorphopsæ. This phenomenon is usually followed by the sudden appearance of a dark web or veil or a cloud coming in front of the eye and localised to a particular area to which the detachment is confined. Detachments occurring in the upper part of the fundus are relatively more common than those occurring in the lower part and are usually of sudden onset, appear as a bulging sac in the retina and are frequently accompanied by a tear or a rupture of the retina. Those starting in the lower part of the eye are usually of slow development, are not so bulging but flat in appearance, they remain localised to the area involved and are seldom accompanied by tears or ruptures. In cases of recent detachment, a cloudiness or an opacity of the vitreous may be seen in the neighbourhood of the detachment, usually accompanied by a tear situated in the periphery, and the details of the papilla in the centre may appear hazy, and in later stages floating opacities may be seen. When a detachment is of recent origin and can be taken in hand immediately, there is the possibility of a cure resulting in the complete sense of the term both as regards function and appearance. In other cases the detachment may settle down to the lower part of the fundus and spare the macula and fairly useful vision may remain for a pretty long time, a few such cases occurring every now and then.

Dealing with the prognosis of detachment of the retina, in a most complete and masterly review of this subject Ernest Thomson cites numerous figures of cures of a spontaneous nature, as well as after various forms of treatment by different observers, and submitting the figures to a most elaborate and critical analysis, summarises his conclusions, putting down the percentage of spontaneous cures at 7.2 and that after all other forms of mixed treatment at 10 per cent. Against this may be mentioned the fact that in May 1912 Vail of Cincinnati, Ohio, addressed a circular letter to 460 leading oculists from all large cities of the United States, enquiring:—

(*a*) How many cases of non-traumatic detachment of the retina have permanently cured?

(*b*) What was your treatment?

Two hundred and eighty-one replies were received in all and out of these 250 reported that they had never cured a single case, though temporary improvement was noticed in many instances. Thirty-one oculists reported having cured 41 cases in all, 25 having cured one case each, 4 had two cures and 2 had 4 cures each. In two of these cured cases the detachment was due to the albuminuria of pregnancy, which cannot be included in this series, leaving in all 39 cases of cure ultimately secured after having employed every known line of treatment. In about half of this number the cure was not convincing from the records submitted, leaving in all about 20 cases of cure. Hence Vail concludes that the prospects of a cure are reduced to less than 1 out of 1000. This is an unnecessarily pessimistic and low figure. An interesting report was published in 1916 by the Committee appointed by the Ophthalmoscopic Society of the United Kingdom to report upon the cure of detachment of the retina. A case was accepted as cured if the retina became reattached and remained so for a period of not less than six months, irrespective of the restoration of proper function or the visual result. In all 85 cured cases were reviewed, and a large majority of them—51—had myopia as an ætiological factor. A haze or cobweb opacities were reported in many of these cases. In 44 cases recovery was attributed to some form of operative interference; in 24 cases recovery was spontaneous; and in 17 cases was due to non-operative treatment, in which rest in bed and the use of a pressure bandage played an important part.

The following is an interesting case of a detachment of the retina in a myopic eye, in which a definite line of treatment was adopted with complete rest in bed, which resulted in a complete cure of the detachment both as regards appearance and function:—

History.—R. D. A., age 17, son of a medical colleague, was sent to me for refraction of his eyes. Under homatropine and cocaine his refraction and correction was as follows:—

R. E. $\frac{c-7 \text{ d Sph.}}{-1 \text{ d cyl. ax. } 30 \text{ d \& out}=6/6.}$ J. 1.

L. E. $\frac{c-7 \text{ d Sph.}}{-1 \text{ d cyl. ax. } 30 \text{ d \& out}=6/6.}$ J. 1.

About 14 months afterwards he again saw me with a complaint that about three days previously while

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

getting up from his bed he noticed a shadow in front of his right eye which was persistent, and there was dimness of vision with it also. He said that once before he had had a similar complaint after an over-strain of the eyes, but at that time it had disappeared in a few hours. The only important part of the history was that the lad had just finished his matriculation examination and had been playing tennis for 2 or 3 hours daily for the last week or two. The vision of the right eye was reduced to 6|36 with the glasses he was wearing. The right pupil was a little more dilated than the left and the reaction to light was a little less active than in the other eye and the tension of the eye was normal. Under homatropine and cocaine a large and fairly transparent detachment of the retina was found occupying the upper and the outer quadrant of the right eye and it presented all the typical signs. The nature of the trouble was explained to the boy, and as at that time his parents were in Bombay he hastened there to obtain a second opinion on his case. The boy's father who was a medical man was also informed of the condition of the son's eye. They consulted an eye specialist in Bombay who confirmed the diagnosis and endorsed the opinion. They immediately returned home and started treatment. He was at once put to bed and complete rest, physical and physiological, was enjoined; both eyes were bandaged and subconjunctival injections of saline solution beginning with a 4 per cent. strength were given in Tenon's capsule over the site of the detachment. Each succeeding injection was increased in strength, till a 10 per cent. solution was reached which was kept up. In all about 10 such injections were given, every 3rd, 4th or 5th day, varying with the reaction the injection induced. Internally he was given urotropin grs. 7 twice daily, which is said to produce a salutary action on the secretions of the ciliary body, and a mixture containing potassium iodide, sodium salicylate, etc., with salines. After a course of treatment lasting for about a fortnight, he noticed that the dark veil in front of his eye was less conspicuous on looking about, and it gradually grew less and less, till after a rest in bed of about six weeks he found that he could see just as well as before with his glasses. An ophthalmoscopic examination of his eye was made under homatropine and cocaine and no sign of a detachment could be made out at all. He was gradually allowed more freedom to sit up and go about a little slowly. Three weeks later he had an attack of fever which turned out to be an exceptionally severe attack of typhoid fever, lasting for about 6 weeks. The patient remained in a semi-comatose condition during the last week or ten days and was kept on nasal feeding and medication, so great was the toxæmia of the typhoid attack. The prolonged period of rest in bed had evidently upset his metabolism considerably. He eventually got better, and the convalescence was uninterrupted. His eye was re-examined 11 months after the detachment under homatropine and cocaine with the correction, and his vision was as follows:—

R. E. $\frac{\text{c}-7 \text{ d Sph.}}{-1 \text{ d cyl. ax. } 30 \text{ d \& out}=6/6 \text{ ptly.}}$ J. 1.

L. E. $\frac{\text{c}-7 \text{ d Sph.}}{-1 \text{ d cyl. ax } 30 \text{ d \& out}=6/6.}$ J. 1.

The ophthalmoscopic examination revealed no evidence whatever of a detachment and the retina was found completely re-attached and fully functioning. In fact the retina was found so firmly re-attached that such evidence as spotting of the fundus or rectilineal striations with or without pigmentation or the curved line of demarcation of a yellowish or whitish colour separating it from the healthy fundus was conspicuous by its absence. He was then allowed to continue his study in the Arts College.

From an isolated case of this nature no positive deduction can be arrived at, but the facts are well worth bearing in mind, that a cure in the complete sense of the term can occur, though very seldom indeed, and although we are not in a position to determine what part of the success achieved was due to therapeutical measures and what part spontaneously to nature, no efforts should be spared to do all that can be done in the interest of the patient. The boy's visual acuity now, several years after the detachment, is just the same, and nearly normal in spite of the fact that he is actively pursuing his studies.

REFERENCES.

(1) Ernest, Thomson: Detachment of the retina reviewed. *The Ophthalmoscope*, Vol. VII, 1909 and Vol. VIII, 1910.

(2) Derrick, T. Vail: An enquiry into the results of the established treatment of detachment of the retina. *Trans. American Academy of Ophthalmology and Oto-Laryngology*. August 1912.

(3) A. Maitland Ramsay, Leslie Paton, and Stephen Mayo: Discussion on detachment of the retina. *Trans. Oph. Soc., U. K.*, Vol. XXXV, 1915.

(4) Report of Committee on detachment of the retina: *Trans. Oph. Soc., U. K.*, Vol. XXXVI, 1916.

(5) Gonin J. Lausanne: Pathogenesis and Pathological Anatomy of Detachment of the Retina. Abstract of the *British Journal of Ophthalmology*, Vol. VI, 1922, p. 221.

(6) Romer: *Text Book of Ophthalmology*, 1912.

A NOTE ON *SPIRILLUM MINUS* (CARTER), THE CAUSATIVE ORGANISM OF RAT-BITE FEVER.

By Dr. M. J. PARMANAND, M.D. (Bom.).

(*From the Adams-Wylie Memorial Hospital and Pathology Department of the Seth Gordhandas Medical College.*)

THE author of this note investigated a few cases of rat-bite fever at the Adams-Wylie Hospital in the year 1922. A detailed description of the morphology of the causative spirillum and the technique employed in isolating and demonstrating the organisms was then given (Parmanand, 1923).

Most workers on this subject have recognised the difficulty of staining the flagella of *Spirillum minus*, the causative organism of rat-bite fever. Futaki (1917), the discoverer of this organism in this article says that "the flagella may or may not become stained by Giemsa's stain or silver solution". Adachi (1921) recommends fixation of the smears with methyl alcohol or osmic acid vapour and staining with Akashi's solution rendered slightly alkaline. Akshi's solution, he says, is a modification of Giemsa's stain. He further states that "it was not always possible to obtain the same staining power though the method of preparation was always the same." Mackie and McDermott (1926) however appear to have obtained satisfactory results with this method. "Staining of the flagella was only occasionally achieved" by Mooser

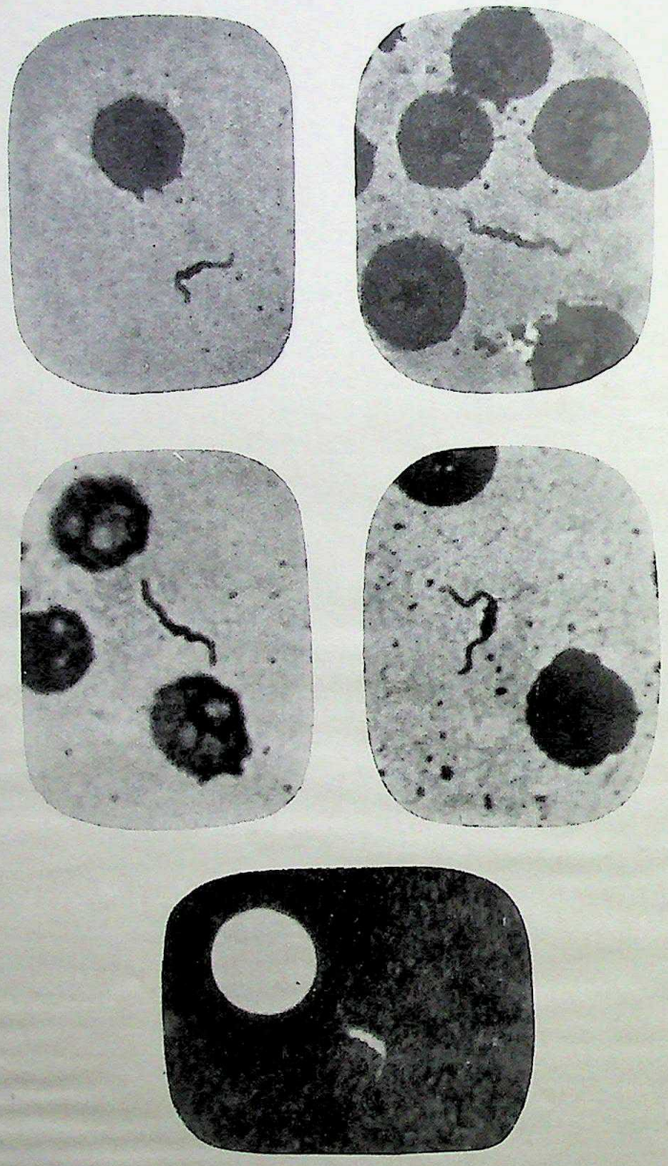
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PLATE I.



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(1924), but he was able to demonstrate them more easily by Burri's method. Robertson (1924) encountered the same difficulty and says that "for some reason the flagella are very difficult to stain and even using the same technique constant results could not be obtained." Knowles (1928) stains his specimens with Tribondeau's modification of Fontana's stain and in his experience this method brings out the terminal flagella with considerable constancy.

The presence of flagella in my strains of the organism was first noticed in specimens stained by the usual Fontana's method. Since then I have been able to demonstrate them by the Indian ink method on repeated occasions. I must here state that the only brand of ink found suitable for the purpose is "Pelican" brand Indian ink made by Gunther and Wagner. The number of successful preparations showing the organisms with flagella were very few indeed. An attempt was then made to find out a good method for staining the flagella and the following modification of Fontana's method was devised and was found to give a greater number of successful preparations than any other method:—

(1) *Solution No.* 1 (*Fixative*).

Formalin	.. ..	20 c.c.
Aqua distill	.. ..	100 c.c.

(2) *Solution No 2* (*Mordant*).

Tannic acid	.. ..	20 G.
Aqua distill	.. ..	100 c.c.

(3) *Solution No.* 3.

Silver nitrate	.. ..	5 G.
Aqua distill	.. ..	100 c.c.

This solution is ammoniated before use till one gets a faintly opalescent fluid. The method of staining is the same as in the original Fontana method. The smears must be thin and the slides must be warmed carefully after sufficiently flooding them with solutions No. 2 and No. 3.

The smears or portions of smears in which the plasma layer has remained unruffled and do not show any tears under the microscope, contain the best specimens of the organism showing the flagella. I generally prepare a dozen smears from the blood of an infected guinea-pig and stain them by the above method and am able to get at least two or three good preparations showing the organisms with unmistakable flagella.

Recently, however, I have been using the method recommended by Coles (1926) of relief staining with a saturated aqueous solution of nigrosin. The organisms appear white against a uniformly blue back-ground. The flagella are clearly brought out by this method of relief staining. The technique is precisely the same as in the Indian ink method, but the slides must be absolutely clean and grease free.

Some observers have occasionally come across more than one flagellum at each end. This appearance, however, is said to be produced by the fraying of the flagellum brought about by the action of fixatives and mordants used in the various processes of staining. Futaki, Takaki, Taniguchi and Ohsumi (1917) also noted two terminal flagella in some of their preparations. But later on Futaki, Takaki, Taniguchi, Ohsumi, Ishiwara and Ohtawara (1925) concluded that this was probably due to some technical errors, and further say that "this organism has only a single long flagellum at each end of its body." Robertson (1924) observes that the appearance of multiple, flagella at each end "seems to be more the result of the fixative than a characteristic of the parasite, as in fresh speciments in which the movements have slowed it has only rarely been possible to demonstrate more than one flagellum." McDermott (1928) stained his specimens with Adachi's method and found one to seven flagella at each end of this organisms. The author of this note has occasionally encountered organisms showing two flagella at each end in films stained by the modified Fontana's method, but has never seen more than one flagellum at each end when the organisms are observed in the living condition under dark-ground illumination.

Finally several attempts were made to cultivate the organisms in Noguchi's and Joekes' media but they were all unsuccessful.

The photomicrographs were taken in the Pathology Department of the Seth Gordhandas Sunderdas Medical College, with Bausch and Lomb's euscope with the camera attachment.

Acknowledgments.

I am grateful to Professor V. R. Khanolkar, M.D., B.SC. (Lond.), Professor of Pathology and Bacteriology at the Seth Gordhandas Sunderdas Medical College, for giving me an opportunity to work in his Department and also for much kindness and advice. My thanks are also due to Dr. R. N. Parmanand, Medical Officer in charge of the Adams-Wylie Memorial Hospital, for giving me facilities in obtaining clinical and other material.

REFERENCES.

Adachi, K. (1921), *Journ. Exp. Med.*, Vol. XXXIII, p. 647.

Coles, A. C. (1926), *Journ. Trop. Med. and Hyg.*, p. 170.

Futaki, K., Takaki, J., Taniguchi, J., and Ohsumi, S., (1917), *Journ. Exp. Med.*, Vol. XXV. No. 1, p. 33.

Futaki, K., Takaki, J., Taniguchi, J., Ohsumi, S., Ishiwara and Ohtawara (1925), *Report of the 6th Congress of the F. E. A. T. M.*

Knowles, R. (1928), *An Introduction to Medical Protozoology*, Calcutta.

McDermott (1928), *Quart. Journ. Med.*

Mackie, T. J. and McDermott (1926), *Journ. Path. and Bact.*, Vol. XXIX, p. 493.

Mooser, H. (1924), *Journ. Expt. Med.*, p. 589.

Parmanand, M. J. (1923), *Indian Journ. Med. Res.*, Vol. XI, No. 4, p. 181.

Robertson, Andrew (1924), *Annals of Trop. Med. and Parasit.*, Vol. XVII, No. 2.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

AN IMPROVISED DROP REGULATOR.

By R. L. SPITTEL, F.R.C.S.,
Surgeon, General Hospital, Colombo.

It is, perhaps, not too much to claim that a drop regulator for controlling the flow of saline and glucose solutions in proctoclysis and of various antiseptic lotions in the continuous irrigation of septic wounds, is one of the most important pieces of apparatus a ward can possess.

In the absence of such a regulator one finds, on visiting a patient for whom, for example, continuous proctoclysis has been ordered, that the apparatus is more often than not conspicuous by its absence. On inquiry as to the reason for this one learns that "the saline has been given, but the patient has returned it." And yet his life may depend on his absorption of the fluid administered.

Such a complaint is seldom heard when a drop regulator is in use and the visible outflow so controlled that the drip is at its tardiest, several seconds intervening between the incidence of any two drops. Then proctoclysis can be maintained for hours on end without mishap.

Murphy, to whom we owe the idea of proctoclysis, used no stop-cock at all, but aimed at obtaining a slow drip by placing the upper level of the fluid in the reservoir just above the anal level, and connecting the rectal tube through rubber tubing with the stem of a glass Y-tube, one arm of which joined up through rubber tubing with the outlet nozzle of the reservoir, and the other end with a glass U-tube which was hung inverted on the rim of the reservoir to permit of the escape of flatus and regurgitant fluid. But this is a very difficult method of administering adequate proctoclysis; and now the intervention of a stop-cock regulator of some sort is, I believe, more or less in universal vogue. It is certainly fool-proof and easy.

For the continuous irrigation of septic wounds too (Carrel-Dakin drip) the drop regulator is a great necessity.

There are many drop regulators on the market, such as Canny Ryall's, in which the stop-cock is part of the apparatus, or Laurie's which is solely a dropper necessitating a stop-cock on the proximal tubing. But these special apparatus have a great knack of getting easily broken, and are not readily replaceable at a pinch in remote hospitals.

Fig. 1

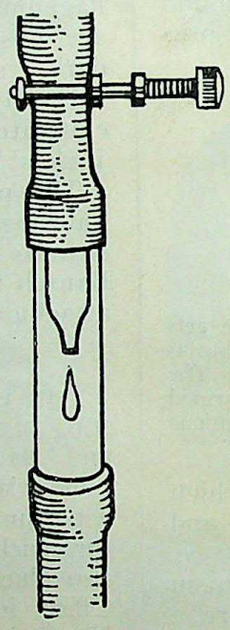


Fig 2

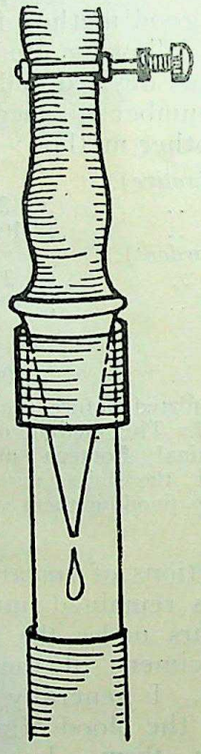


Fig. 3

I write this note to call attention to the ease with which such droppers can be improvised out of materials readily obtainable anywhere. I have little doubt that this obvious device has occurred to many others as well; but I have nowhere seen it described.

The apparatus is made as follows:—Take the tapering end of a pipette, or an empty ampoule filed off at either end—preferably one thinning out both ways because it is easy to file, such as the saline ampoule of an electrargol set. This is snugly fitted into a short length of glass tubing by means of a thin rubber collar, if necessary, outside the pipette-end or ampoule (fig. 1) to make up for any

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

disparity between the outer and inner tubes. All that now remains to be done is to connect rubber tubing to either end of the glass tube and to provide a regulating stop-cock on the reservoir side of the dropper, as shown in fig. 2.

The same idea may be carried out with an ordinary irrigating nozzle fitted into a filed off test-tube and connected by a small piece of rubber tube where the base of the nozzle makes contact with the test-tube as in fig. 3.

There are many other simple variations of these devices which will suggest themselves according to the variety and calibre of the glass tubes available.

(Since writing the above, I have read with much interest the article by Lieut.-Col. Proctor in the January 1929 number of the *Indian Medical Gazette*.)

ANALYSIS OF A HUNDRED CASES OF CATARACT EXTRACTION AT THE RAIPUR MAIN HOSPITAL BY SMITH'S METHOD WITH A FLAP OF CONJUNCTIVA.

BY H. B. D. NANHORYA, M.B., B.S.,
Assistant Surgeon, Main Hospital, Raipur, C. P.

(A) *Preliminary.*—The routine examination of the eye to be operated on is gone through as follows:—

(*a*) *Lachrymal Apparatus.*—If this be diseased the operation is postponed till the condition is improved.

(*b*) *Conjunctival Sac.*—Slight mucous discharge is neglected, but if it is much and muco-purulent the eye is treated for a few days before being operated on. Irrigating the eye with boric lotion grains 10 to 1 oz. and instilling a few drops of protargol, grains 10 to 1 oz. or acriflavine 1 in 1,000 twice daily, clears up the discharge in 3 to 4 days' time.

(*c*) *Cornea.*—In cases of old central leucoma, a peripheral iridectomy with extraction of the lens is sufficient to restore good useful vision to the patient.

(*d*) *Iris and Pupil.*—If there is no reaction or sluggish reaction of the pupil, a preliminary iridectomy is done, and in suitable cases extraction of the lens is performed after two or three months with a good useful vision.

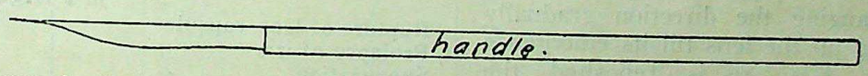
(*e*) *Projection and perception of light.*—This is absent in old glaucomatous cases, which are not suitable for operation.

(*f*) *Tension.*—This, if on the plus side, should warn us to be more careful during the operation.

(B) *Preparation.*—The eyelashes are cut short and the patient is put on the table and 10 per cent. cocaine solution is put into the conjunctival sac thrice at intervals of five minutes each. The outside of the eye is cleaned with a cotton swab soaked in hydrarg. perchlor. lotion 1 in 4,000. Smith's eye speculum is put in and the conjunctival sac is irrigated with 1 in 5,000 solution of hydrarg. perchlor. with the irrigator at about 5 ft. height.

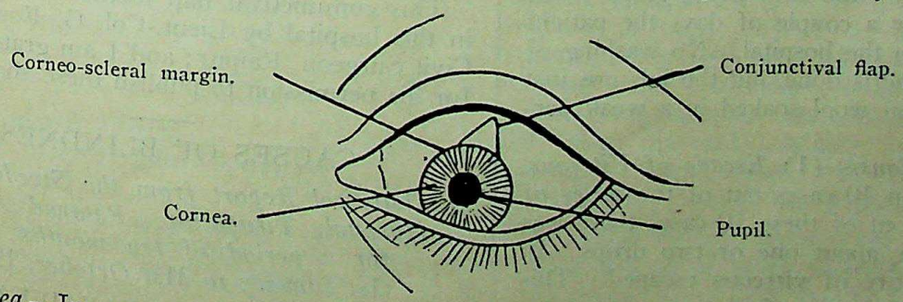
(C) *Operation.*—Smith Wilson's cataract knife is used here as it has an advantage over other knives. The blunt edge is straight and in the same line as the handle, while the sharp cutting edge is curved and tapers to a fine point. The advantage of this is that a minimum force is required to puncture the sclero-corneal junction because a force acts to the best advantage when applied in a straight line; since we hold the knife with the blunt edge downwards which is straight; and consequently the point of the knife is not damaged too soon.

SMITH WILSON'S KNIFE.



The knife enters at 9 o'clock and emerges at 3 o'clock and with a slight to and fro movement the corneo-scleral margin is cut on both sides. The cutting edge of the knife, when it reaches 11 to 1 o'clock, is tilted a little backwards and while finishing the incision a conjunctival flap is taken up with the cornea. This flap is generally triangular in shape and can always be taken up in the incision.

The advantages of this conjunctival flap are:—



(1) The margins of the wound in the cornea are satisfactorily apposed by manipulation of the flap. It sometimes happens that after the delivery of the lens, the lower margin of the wound

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is sucked in to the cavity and it is difficult to have satisfactory apposition of the margins of the wound with the consequent attendent dangers. All this is obviated by means of the flap.

(2) It gives an additional support to the wound and consequently a firmer cicatrix, which is so essential with some patients who, contrary to instructions, get up and try to walk just after the operation.

(3) There is less likelihood of prolapse of the iris.

(4) It effectually shuts off any infection in the conjunctival sac; as it has been noticed even during the operation that if the flap is not turned down over the cornea it again sticks to its original place.

(5) It expedites the healing of the wound as a skin graft does in other places.

The conjunctival flap is turned down over the cornea and iridectomy is performed, care being taken not to button-hole the iris, in which case there will be a little difficulty in the delivery of the lens. The speculum is removed and the eye cleaned with a sterile cotton wool. The operator holds up the upper lid with an eyelid retractor held with the thumb, index, and middle fingers of the left hand, while the little and ring fingers of the same hand control the upper part of the orbicularis oculi. The lower part of the orbicularis is held by the assistant. A strabismus hook is held in the right hand and the lens is dislocated from its attachment by gentle semicircular strokes just below the sclero-corneal margin. The delivery of the lens is effected by firm moderate pressure applied backwards and upwards, and changing the direction gradually upwards following up the lens till its emergence from the wound. The iris is reposited, the margins of the wound apposed and the conjunctival flap is replaced in its original position and the eyes bandaged.

(D) *After-treatment.*—Both eyes are bandaged for the first three days and the patient is instructed to lie as quietly as possible for this period. Milk is the diet for the first 24 hours and after this ordinary food is allowed. On the 4th day the eye is opened and the eye pad changed and the unoperated eye left unbandaged, the eye is now opened every alternate day and the pad changed; on the 10th day a green shade is given, and after a couple of days the patient is discharged from the hospital. No washing of the conjunctival sac is done, but the lids are just cleaned with cotton wool soaked in a weak perchloride solution.

(E) *Complications.*—(1) *Escape of Vitreous.*—This occurred in 10 cases out of the series of 100 cases. In 9 out of these 10 cases there was very slight escape, about one or two drops. In one a large quantity of vitreous escaped. This case is described subsequently.

(2) *Rupture of the capsule.*—This occurred in 4 cases, out of which in one case it could not be detected till the 4th day after operation and hence was left in. In two cases the capsule could not be taken out, owing to adhesions, and in one case it was removed during the operation. The capsule did not interfere with the vision as it was in the periphery; in all three cases the condition was much cleared subsequently with dionin drops.

(3) *Prolapse of the iris.*—There was prolapse of the iris in one case only, to be described subsequently.

(4) *Suppuration of the eyeball.*—There was only one case, but the other eye of this same patient which was exactly in the same condition was operated on a few days later with very good results.

(5) In a solitary case as soon as the incision was finished the lens, vitreous, and iris shot out of the eyeball. The eye was at once closed and bandaged. On opening on the third day, the cornea was found turned over on itself with a prolapse of the iris and the wound gaping wide. The cornea was turned up and the conjunctival flap straightened out and the eye was again bandaged. Healing took place and there was vision in the eye, but the prolapsed iris remained under the conjunctival flap. As it is so difficult to be in touch with patients after operation we know nothing further of this case. This is the case referred to under (1) and (3).

Cases operated on, 100.

Complications.	Number.	Percentage.
Escape of vitreous ..	10, in 9 slight and in 1 large.	10
Rupture of lens capsule	4	4
Prolapse of iris .	1	1
Suppuration ..	1	1

(F) *Other cases.*—(1) *With a sluggish or no reaction of the pupil.*—4 cases belonged to this category. A preliminary iridectomy was done in these cases about four months previously and the reaction returned. These were successfully operated on with good vision and no after complications.

(2) *With central corneal leucoma.*—2 cases of this nature were operated on with peripheral iridectomy with good results.

This conjunctival flap method was introduced in this hospital by Lieut.-Col. G. Fowler, I.M.S., Civil Surgeon, Raipur; and I am grateful to him for his permission to publish these short notes.

CAUSES OF BLINDNESS.

A Statistical Report from the Swedish Mission Hospital, Tirupattur, Ramnad District, for a period of ten months (from 1st January to 31st October, 1928).

BY G. JOSEPH GNANADIKAM,
Swedish Mission Hospital, Tirupattur, Ramnad.

IT is the experience of almost every eye surgeon in this country to encounter at least one

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

patient a day for whom he can do nothing. If a report could be taken from every eye hospital of cases of blindness that attended, it would present a fairly accurate survey of the causes of blindness in India. The following is a table prepared from cases that attended the Swedish Mission Hospital, Tirupattur, Ramnad District, and can be claimed to be a relative index of the various causes of blindness, at least in this part of South India (Ramnad, Tinnevelly, Madura, Trichinopoly and Tanjore Districts).

No.	Name of the Disease.	One or both eyes affected.	Blindness. Partial. eyes.	Complete. eyes.
1.	Trachoma ..	Single	17	10
		Double	22	5
2.	Gonorrheal ophthalmia	Single	6	2
		Double	12	12
3.	Keratomalacia ..	Single	26	15
		Double	17	14
4.	Keratitis ..	Single	18	..
		Double	5	..
5.	Smallpox	Single	23	21
		Double	14	12
6.	Staphyloma ..	Single	8	20
		Double	3	17
7.	Corneal ulcer	Single	96	57
		Double	19	10
8.	Corneal scars (after ulcer)	Single	60	25
		Double	16	25
9.	Corneal scars (after injury)	Single	20	10
		Double	6	2
10.	Injury of eye ..	Single	35	14
11.	Iritis, irido-cyclitis, etc. ..	Single	35	23
		Double	11	16
12.	Glaucoma ..	Single	75	128
		Double	46	93
13.	Inoperable hypermature cataract	Single	..	17
		Double	..	2
14.	Couching ..	Single	18	48
		Double	..	5
15.	Failed operation (from other hospitals) ..	Single	2	7
		Double	1	..
16.	Sympathetic ophthalmia ..	Single	3	5
17.	Optic atrophy ..	Single	3	1
		Double	26	24
18.	Retro-bulbar neuritis ..	Single	..	1
		Double	6	3
19.	Retinitis pigmentosa ..	Single	..	..
		Double	9	2
20.	Other fundus diseases ..	Single	9	9
21.	Microcornea and other congenital affections ..	Double	33	14
22.	Panophthalmitis ..	Double	5	5
		Single	..	31
23.	Phthisis bulbi ..	Double	..	4
		Single	..	80
24.	Tumours	Double	..	31
		Single	..	8
		Double	..	2

Total number of eyes affected 2,044

Total number of eyes treated during the period of ten months 10,196

Note.—"Partially blind" means sight from detection of hand movements, to moving about with difficulty. Even patients who can read only big characters are not taken in.

Going through the above table, one easily notes the folly of procrastination, so markedly shown by the large number of patients suffering from glaucoma, over-ripe cataract, and perhaps optic atrophy. In many instances poverty also plays a part. By the time a patient is able to save funds enough for a journey to the eye hospital, the sight is gone. Want of intelligence also may be said to contribute a share: the patient realises that he is blind only very late. Want of facilities for immediate attention is shown by the large number of cases of blindness due to corneal ulcer, injury, iritis, and possibly panopthalmitis. One well knows how much early treatment can do in such cases. The couchers claim a good share in blinding many. It is a pity they should thus go on unchecked. It will be seen so many as 142 eyes are classified under phthisis bulbi. It was impossible to elicit from the patient the precise cause of the condition.

It may not be out of place to quote here the statistics of the blind children in the School for the Blind at Palamcottah. This is taken from the school's latest annual report.

	Boys. per cent.	Girls. per cent.
Corneal Affections (scars, staphylomas) smallpox 14.9 per cent. otherwise 23.8 per cent.	38.7	26.5
Atrophy and phthisis bulbi ..	35.2	49.3
Congenital defects (including congenital cataract and fundus affections)	14.8	18.2
Injury	1.1	1.5
Optic atrophy (non-congenital) ..	4.3	1.5
Cataract (non-congenital) ..	4.3	...
Glaucoma	1.1	1.5
Sighted (fairly good vision) ..	0.6	1.5

The conclusion arrived at by the specialist who examined the children is, "The statistics, both for boys and girls, demonstrate the very large amount (practically 75 per cent.) of affections caused by diseases that, under favourable circumstances, might have been preventable."

The only object of sending this for publication is to show *the overwhelmingly large number of cases of preventable blindness in our country.* As was said before, poverty, procrastination, absence of hospitals nearby, and illiteracy are the main causes. As a remedy, two things could be suggested; first to open more hospitals especially in rural parts, and secondly to start itinerant hospitals in every district not merely for eye treatment, but also for educating as well as warning those suffering from such unwary diseases as glaucoma, etc. In a vast country like India, itinerant hospitals will be of great use, and if once started, will certainly come to stay till every hamlet has a doctor.

If similar reports from other hospitals come in, they will be of much instructive value.

My thanks are due to Dr. F. Kugelberg, M.D., the Chief Medical Officer, Swedish Mission Hospital, Tirupattur, Ramnad District, for kindly helping me in the preparation of this article and permitting me to send it for publication.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A MODIFIED SIPPY'S LINE OF TREATMENT IN DUODENAL ULCER.

By B. G. VAD, M.D.,

and

N. W. KULKARNI, M.B., B.S.,

Sir J. J. Hospital, Bombay.

THE difficulties in the early diagnosis and treatment of cases of duodenal ulcer are well known to the medical profession. Before the introduction of the new lines of treatment by Sippy, Lenhart and others, and of their modifications, surgical interference was supposed to be the only treatment for a radical cure, and even now the same view is held by many surgeons. Having seen a few cases treated by operative methods doing quite well for a few months, but showing signs of rcurrences, perhaps in an aggravated form, it was decided to give a trial to a modified Sippy's line of treatment. Suitable opportunities did not come in soon, as the treatment requires the intelligent co-operation of the patient who must be prepared for a period of rigid abstinence.

In this line of treatment, diet is as important as drugs. The patient is allowed to take nothing but a limited quantity of milk at stated intervals for a month or so. Wines, smoking and even tea are strictly forbidden. All septic foci must be attended to. The details of the treatment as given by us are as follows:—

7 a.m. Bismuth oxycarbonas, oz. ½, suspended in 10 ounces of water, to be sipped, and the patient to lie on the right side.
7-50 a.m. Olive oil, oz. ½.
8 a.m. *Feed I.*
i.e., Sodium citrate grs. 10.
Magnesium oxide grs. 10.
Macilage q.s.
Aqua dr. 2.
added to 7 ounces of milk.
9 a.m. *Mixture I.*
i.e., Creta preparata grs. 10.
Bismuth oxycarbonas grs. 30.
in as little water as possible.
9-50 a.m. Atropine sulphate gr. 1|200, by mouth.
10 a.m. Feed I.
11 a.m. Mixture I.
11-50 a.m. Olive oil oz. ½.
12 noon Feed I.
1 p.m. Mixture I.
1-50 p.m. Atropine sulphate gr. 1|200 mouth.
2 p.m. Feed I.
3 p.m. Mixture I.
3-50 p.m. Olive oil oz. ½.
4 p.m. Feed I.
5 p.m. Mixture I.
5-50 p.m. Atropine sulphate gr. 1|200 by mouth.
6 p.m. Feed I.
7 p.m. Mixture I.
7-50 p.m. Olive oil oz. ½.
8 p.m. Feed I.
9 p.m. Mixture I.
9-50 p.m. Atropine sulphate, gr. 1|200 by mouth.
10 p.m. Feed I.
11 p.m. Mixture I.
Close down by an injection of atropine sulphate gr. 1|100, hypodermically, just before going to bed.

The milk should be gradually increased till the patient takes 10 ounces at each feed in about a fortnight to three weeks' time. In about a month's time, if there be no pain or any other symptom, a little custard or pudding, biscuits, some cocoa or some chocolates may be allowed. Afterwards he should be allowed gradually to take some soft portion of bread and butter, half-boiled eggs, etc. In about five or six weeks' time the patient should be permitted to take some meat and fish, a little minced chicken etc. till he gradually returns to his normal diet. In vegetarians the return to the normal diet is more easily adjusted. In all cases the patient must be warned against indulgence in fried and hot things, chillies etc.

If the patient complains of diarrhœa, the magnesium oxide in each feed should be diminished. If the patient complains of some acidity or pain on rising in the morning, he should be advised to take a feed of milk some time in the small hours of the morning, if he wakes up. After six weeks' treatment on these lines, the patient should be advised to give up the drugs gradually.

As the treatment involves a strict and to some extent tiresome routine, it was possible to try it in only three cases. All these three patients carried out the instructions in every detail and the results obtained have been consistently good. It has been possible to keep in touch with two of these patients, who after the treatment are not only free from any of the symptoms for the last many months, but have steadily gained in weight and are enjoying perfect health. (vide weight graph.)

The accompanying Table I, gives a precis of a few cases of duodenal ulcer that recently came under our observations.

The two important laboratory findings on which stress is laid, viz., the presence of occult blood in stools and marked hyperchlorhydria, may be absent. This is especially the case in patients who come under observation for diagnosis and treatment after having undergone for some time treatment by alkalies and milk diet. The two findings may have significance in cases which seek diagnosis and treatment for the first time. Moreover, in view of the recent findings by various workers, diagnostic significance cannot be attached to the percentage of free hydrochloric acid in the gastric contents. Diagnosis will have to be made chiefly by clinical findings, aided by *x*-ray examination.

It is not necessary here to enter into discussion of the rationale of this line of treatment, which aims at keeping the site of the ulcer completely free from free hydrochloric acid, which is supposed to retard the healing. The advantage in this line of treatment is that once the ulcer is healed up, the chances of recurrence are very much less than

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

TABLE I.

Initial of Patients.	Date of Admission.	Date of Discharge.	Age.	Sex.	History of Diet.					Duration of Complaint.	Pain.			History of hæmatemesis.	Occult blood in fæces.	Gastric analysis after Ewald test meal C.Cs in term of N/10 NaOH				Evidence of Doudenal Ulcer by x-ray examination after bismuth meal.	Treatment.	Remarks.
					Vegetarian.	Non-Vegetarian.	Alcohol.	Smoking.	Pyorrhœa.		Site.	Relation to food.	Relieved by vomiting.			Free HCl.	Combined acidity.	Total acidity.	Organic acids.			
M. S.	5-3-28	22-5-28	40	Male	No	Yes	Yes	Yes	Yes	8 years	Above and to the right of the umbilicus and back. Tenderness.	2-3 hours after food.	Yes	Yes	Not found	48 c.c.	21 c.c.	69 c.c.	*Nil*	Yes	Modified Sippy's line of treatment,	All symptoms disappeared in 2 weeks. No recurrence. Put on weight and enjoying good health since then.
S. H.	2-2-28	20-3-28	40	Male	No	Yes	No	Yes	Yes	6 years	Above and to left of umbilicus and back.	2½ hours	Yes	No	Not found	30 c.c.	40 c.c.	70 c.c	*Nil*	Yes	Do.	Symptoms disappeared in 2 weeks. Put on weight and enjoying good health, and no recurrence since.
T.E.J.	13-12-27	22-1-28	34	Male	No	Yes	Yes	Yes	Yes	One year	Above and to right of umbilicus and back.	3 hours	Yes	No	Not found	45 c.c.	20 c.c.	65 c.c.	*Nil*	Yes	Do.	Symptoms disappeared in 2 weeks. Put on weight and enjoying good health and no recurrence since.
B. H.	26-3-28	29-3-28	35	Male	No	Yes	No	Yes	Yes	2½ months	Above and to right of umbilicus and back.	1½ hours	Yes	No	Not found	32 c.c.	28 c.c.	60 c.c	*Nil*	Yes	Triple powders R. Bismuth Carb. Mag. Carb. Cal Carb. aa. gr 10.	Symptoms less.
I. B.	7-11-27	21-11-28	40	Male	No	Yes	Yes	Yes	Yes	8 months	Above and to right of umbilicus and back.	1½ hours	Yes	Yes	Not found	20 c.c.	15 c.c.	35 c.c.	*Nil*	Yes	Do.	Symptoms less marked. Recurrence after a few days.
S. S.	8-8-28	13-8-28	35	Male	No	Yes	Yes	Yes	No	About one year	Above and to right of umbilicus and back.	1½ hours	No	No	Not found	40 c.c.	20 c.c.	60 c.c.	*Nil*	Yes	Triple powders.	Symptoms less marked.

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

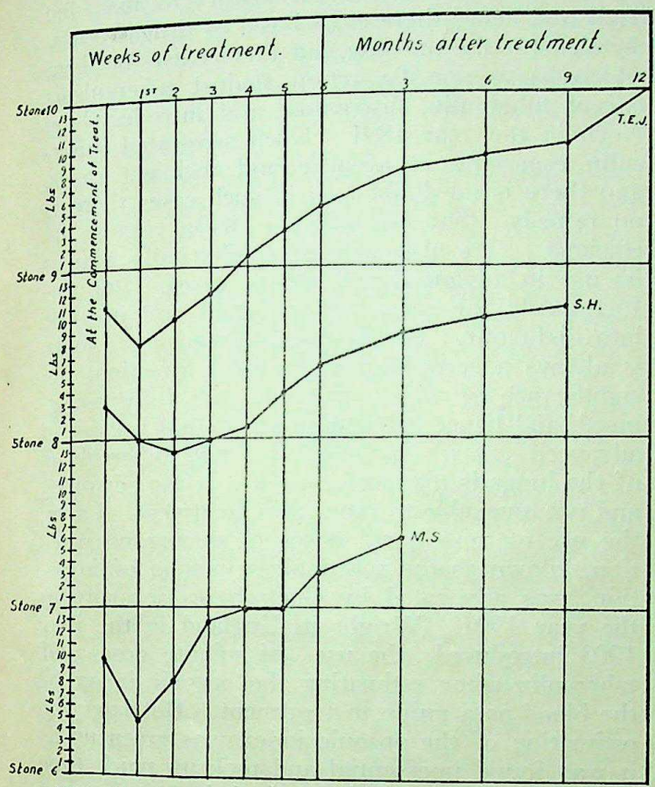
Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

in cases treated surgically, where they are likely to occur at the sutured site. In our hands this line of treatment has given encouraging results, and we believe that it is a treatment of choice in patients who are willing to submit to its rigours. The knife is the only hope for those who will not co-operate.

Graph showing the weights of the 3 patients treated on the modified Sippy's line of treatment.



Note the drop in weight during the 1st week or two, and the gradual increase in subsequent weeks and months in all the 3 cases after the commencement of the treatment.

These observations were carried out in the wards of Lt.-Col. S. S. Vazifdar, M.R.C.P., I.M.S., Senior Physician and Superintendent, Sir J. J. Hospital, Bombay, to whom we are obliged for his kindness and help.

A NOTE ON THE ANOPHELINES FOUND IN BARODA CAMP *

By W. J. WEBSTER, M.C.,
MAJOR, I.M.S.,

A STUDY of the known distribution of the Indian Anophelines(1) appears to indicate that the following record is of interest, as no previous report is quoted from the district in question.

In the course of a calendar year (1927) of general duty in Baroda Camp, a regular watch was kept on the local anopheline population and the following eight species were encountered.

1. *A. subpictus.* This was quite the commonest anopheline and it took every opportunity of breeding in stagnant pools and in any artificial water container.

2. *A. culicifacies.* A large number of this species was captured in bungalows and outhouses in the latter months of the year. Larvæ were found in pools of rain-water after the Baroda floods. In July 1927 the district was under water for miles in all directions and the potential breeding-places were of much greater extent than usual. It is possible that this species is less numerous in a normal year. It had not been noticed earlier in the year, but may have been overlooked, especially as the resting attitude is said to be that of a culicine.(2) As a matter of fact the great majority of mosquito larvæ found while the floods were subsiding were culicines and *A. rossi.*

3. *A. stephensi.* Adults of this species were captured in bungalows and outhouses occasionally throughout the year. Larvæ were found in wells and tanks, and once in a rain-water pool along with *rossi,* and on another occasion in a pool of clear seepage water in a nullah.

4. *A. fuliginosus.* This species was common, but no breeding-place was found within the camp. In the neighbourhood, however, several tanks and some stretches of water in river beds were found to contain large numbers of *fuliginosus* larvæ. All these breeding-places contained clear water with considerable aquatic vegetation. No other anophelines were found along with these but culicines were constantly present. Breeding continued throughout the hot weather. From examination of a large number of larvæ it was concluded that the internal occipital hair of *fuliginosus* larvæ is nearly always simple, occasionally forked, but never branched. There has been some confusion in the literature over this point.(3)

5. *A. theobaldi.* Anophelines of this species were occasionally captured in bungalows and outhouses, and were bred out from larvæ found in a clear pool of seepage water in a nullah bed.

6. *A. jeyporiensis.* A few adults of this species were captured but the larvæ were not located.

7. *A. funestus* (*listoni*). Two adult females were caught in a bungalow. No breeding-place was discovered.

8. *A. maculipalpis.* One adult of this species was bred out from a larva found in a few drops of seepage water, and one was caught in a bungalow.

Hehir (4) gives a list of Indian vectors of malaria in order of importance, and it is of interest that the first four on his list have

---

* Published with the permission of the Director of Medical Services, India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

been found in the square mile which constitutes Baroda Camp, namely, *culicifacies*, *listoni*, *stephensi* and *fuliginosus*.

REFERENCES.

(1) Covell, (1927). The Distribution of Anopheline Mosquitoes in India and Ceylon. *Indian Med. Res. Memoir*, No. 5 (February).
(2) MacGregor, (1927). *Mosquito Surveys*, p. 93.
(3) Strickland, (1927). *The Anopheline Larvæ of India, Ceylon and Malaya*, p. 47.
(4) Hehir, (1927). *Malaria in India*, p. 99.

PLASMOQUIN IN PREGNANCY.

By K. V. THAKKAR, L.M. & S. (Bom.),
Chief Medical Officer, Idar State, Bombay Presidency.

THE treatment of malaria during pregnancy has always required a special degree of care and caution on the part of the medical man. "Quinine in Pregnancy" was the subject of several letters in the correspondence columns of the *Indian Medical Gazette* in 1909, and I then reported a series of cases of malaria in pregnancy successfully treated with quinine. That large doses of quinine can be taken without any ill-effects in pregnancy is well established. But it is also an equally well established fact that quinine occasionally acts as an ecbolic, and is actually made use of to intensify the labour pains or to re-establish them during the course of parturition.

The advent of plasmoquine therefore induced me to try this new preparation in malaria in pregnancy. The first case I treated was in September 1927, a primipara in the 5th month. A dose of sodii bromide grs. x. was given each time, prior to the administration of one tablet of plasmoquine thrice a day. On the second day, the patient against instructions took the tablets without the bromide, as she did not quite like the bromide and thought it was a heating thing. No harm came of the omission, and thereafter she was asked to take the plasmoquine tablets alone, without the bromide. The result was quite good, the fever being checked and the pregnancy uninterrupted, after three courses of plasmoquine with the necessary 4 days remission of treatment. During the last year I have treated four more females in different stages of pregnancy with plasmoquine and without any ill-effect on the uterus. The period of pregnancy in these cases was from three to eight months and the malarial attacks were properly controlled in all but one. In the last case, it was difficult to make the patient take the plasmoquine regularly, owing to her unwillingness to take any drug during pregnancy.

The number of cases treated is too small for any conclusions. But it is sufficient to convince one that in plasmoquine we have a drug which is a useful addition to our armamentarium, as a substitute for quinine, of equal if not of superior value, in cases of pregnancy complicated by malaria.

A VACCINE FOR THE TREATMENT OF PHTHISICAL PATIENTS WHO EXPECTORATE TUBERCLE BACILLI IN THE SPUTUM.

By S. MALLANNAH, M.D., D.P.H.,
Hyderabad, Deccan.

THE search for a specific remedy against tuberculosis is as old as the history of medicine itself and hence there exist hosts of drugs recommended for the purpose, but there exists no drug which has a specific action against tuberculosis except tuberculin, discovered and introduced by Koch in the year 1891. Koch advocated tuberculin especially in afebrile and incipient cases, and there is no doubt that in such cases there is no remedy that can surpass it as regards its efficiency. He also warned emphatically against its use in advanced and febrile cases. But unfortunately the drug was abused and it came into disfavour. Besides in advanced cases there is always a secondary and mixed infection, the significance of which was then not fully recognised, and hence tuberculin was found useless in advanced cases. In actual practice tuberculosis of the lungs is diagnosed when it is far advanced and not amenable to tuberculin treatment. Later, the use of very small doses producing no reaction, known as the reactionless method of injection, was advocated by Goetsch in Germany in the year 1901. Wright in England in the year 1903 introduced the use of minute doses of tuberculin after estimating the opsonic index of the blood as a guide to treatment. But later the estimation of the opsonic index was given up as it was found unessential and took up much time in its technique. This method is largely used in localised tuberculosis such as lupus, tubercular ulcers of the skin, tubercular adenitis of the neck, and tuberculosis of the bones, joints, and urogenital system with marked success. But in cases of pulmonary tuberculosis, especially in advanced cases, this treatment is useless, and there is no treatment known which is satisfactory.

During the last few years I have been working at the preparation of a vaccine for the treatment of such cases and I have secured a vaccine which seems to me to possess a remarkable influence in reducing the temperature and the number of germs in the sputum of patients treated with it.

The method of preparing the vaccine is as follows:—

The sputum of the particular patient is collected in a sterile wide mouth glass stoppered bottle and then an equal volume of carbolic acid solution (5 per cent.) with distilled water is added. The whole is well shaken and heated in a water bath at 70°C. for an hour on three consecutive days. It is then treated with an equal volume of chloroform and ether for an hour, while shaking the bottle well all the time. The supernatent fluid after removing chloroform and ether is taken and sterile vaccine bulbs of 1 c.c. capacity filled with it and sealed. These bulbs are heated in a water bath at 70°C. for an hour on three consecutive days.

The emulsion thus treated and purified is a clear opalescent fluid and is free from living germs. When injected into a healthy rabbit it produces no local reaction or rise of temperature and it is harmless.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

I have named the vaccine "phthisin" in order to distinguish it from tuberculin, and it differs from tuberculin in the four following points:—

1. It is an auto-vaccine of *tubercle bacilli* derived from the patient.
2. It also includes auto-vaccine of other organisms of the mixed infection which may be present in the patient.
3. *Tubercle bacilli* are here defatted and hence they are easily attacked by the phagocytes and body fluids of the patient.
4. As the vaccine contains inflammatory exudate, there is a probability of the existence of anti-tuberculin in it.

This vaccine when injected subcutaneously into a phthisical patient produces no reaction or rise of temperature, but on the other hand it reduces the existing temperature. This decline of temperature lasts for three or four days and patients feel relieved for the time being. Injections (beginning with ½ c.c. and gradually rising to 1 c.c.) are given once a week.

On repeating the injections the germs in the sputum are not only decreased in number but become thinner and shorter and ultimately become highly granular until they disappear altogether from the sputum. Physical signs in the chest gradually clear up if the case is not far advanced. Meanwhile the patient's strength has to be supported by means of nutritious food in the form of eggs, meat and milk and a tonic (such as Scott's emulsion of cod-liver oil with hypophosphites). I have found administration of fresh normal goat serum 10 c.c. (obtained from the Bengal Immunity Co., Calcutta) intramuscularly now and then helps to keep up the strength. As fresh air is very important, the patient must be kept in the verandah day and night and as exertion of any kind causes rise of temperature, absolute rest should also be enforced. In my private practice I am in the habit of prescribing Musculosin (Byla) and Kinazyme (Carnrick) also.

A SUGGESTION FOR IMPROVEMENT IN THE DIETARY OF THE INDIAN COMMUNITY TO SECURE A HIGHER DEGREE OF HEALTH AND EFFICIENCY.

By A. MALLANNAH, M.D., D.P.H.,
Hyderabad, Deccan.

It is a common observation that Indians are physically weaker than other nations and possess a lowered resistance to infections of all kinds. It is true that infections are caused by germs, and a good deal of useful work is being done in the prevention of disease by medical men, but there is another important factor, i.e., lowered resistance, which is generally neglected in dealing with infections. This lowered resistance found among Indians is due largely to the diet. The vast majority of the population live upon a purely vegetarian diet which does not contain sufficient and proper proteins, for example rice and Indian corn. The protein found in the latter, known as *zein*, is not suitable for promoting and maintaining growth as it does not break up into amino-acids like tryptophan and lysin which are necessary for reconstruction into the necessary tissues during life. It is also well recognised now that in order to make a vegetarian diet wholesome and efficient, it should be combined with a liberal amount of milk or its products. This is not possible for the majority as they are not able to purchase milk in sufficient quantity to make the diet efficient. Secondly, the milk can never be obtained germ free. Hence it is not safe unless it is pasteurised. Very few have the knowledge and the time at their disposal to do this thoroughly. Besides cow's milk produces summer diarrhœa and tuberculosis among children if not properly pasteurised. Thirdly, the quantity of milk required to make the diet efficient contains a large amount of water, which puts a strain on the kidneys, and hence it is not advisable to use milk for a lengthened period of time. This is why milk, though considered an ideal diet for infants, is not so for adults. A vegetarian diet, as it contains a large amount of starch in proportion to protein, besides causing bowel troubles, predisposes to diabetes, especially among those who do not take sufficient exercise but have a lot of mental work, and also induces one to obesity when used liberally, and underweight when used sparingly. It is a great mistake to eat more than the body needs and so to grow stout, but it is much worse to eat less than the body needs and so to grow thin.

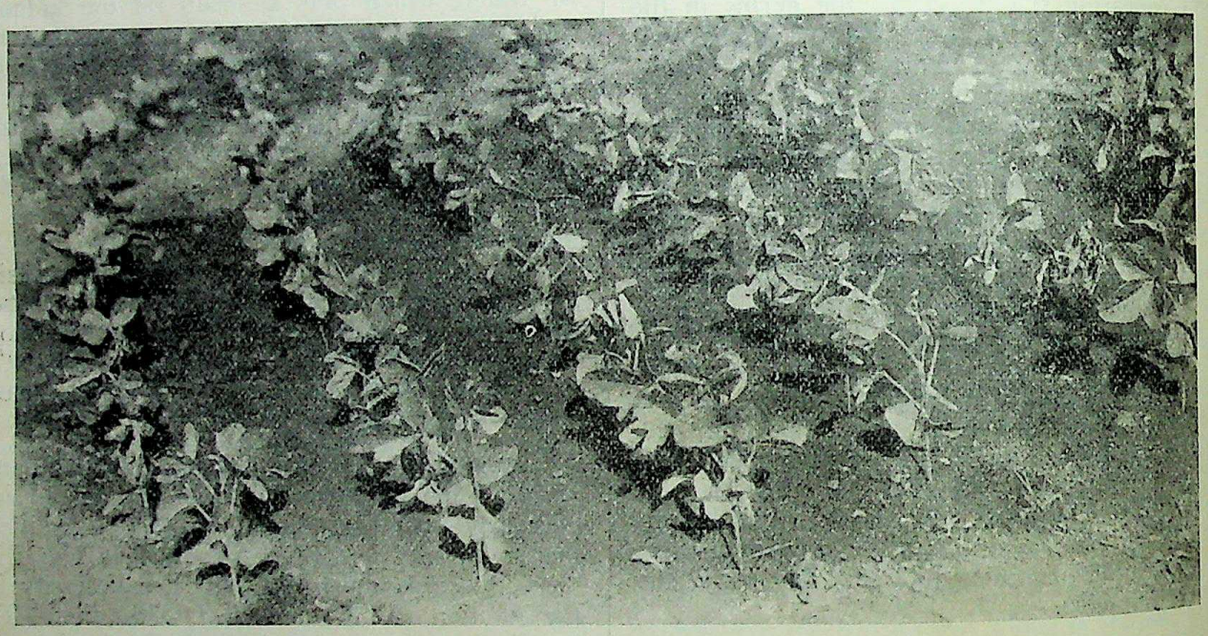
Unfortunately undernutrition is the chief cause of producing the lowered resistance and physical deficiency found in India. In both conditions the amount of protein assimilated is less than the body needs and hence there is a necessity for the addition of milk and meat to the diet. The protein introduced into the body in the form of meat leaves more residue than the protein derived from plants and this causes augmentation of the viscosity of the blood, resulting in arterio-sclerosis. Secondly, meat produces undue putrefaction of protein in the intestines. The absorption of products of putrefaction into the system also causes arterio-sclerosis, the disease which destroys more life than any other disease after the age of 45 and is the chief cause of premature senility. Thirdly, as protein derived from meat contains more purin bodies than vegetable protein, excessive meat diet causes gout and kidney diseases. Lastly, a meat diet, instead of increasing one's endurance, as it has been shown recently, like alcohol, actually reduces it. It is a well recognised fact that the diets of both the well-to-do and the poor are not ideal and scientific, as the former contains too much protein and the latter too little. Both are physiologically unsound and unjustified.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Recently it has been shown that soya bean, being nutritious and palatable, is a wholesome, safe and complete food devoid of infection in itself and not easily liable to contamination. The soya bean, the seed of *Glycine hispida* a leguminous plant, has the appearance of a pea rather than a bean. It grows on a small weak-stemmed plant of the same type as a dwarf garden pea. The plant grows to a height of 7 to 9 inches only and carries 4 or 5 stalks having large, broad trifoliate leaves. The leaves are ovate, having palmate venation, and are 3 inches long and 2 inches broad. It bears tiny white flowers and pods $1\frac{3}{4}$ inches long and $\frac{1}{2}$ inch broad containing 3 or more seeds. The seeds are 3/8 inch long and $\frac{1}{4}$ inch broad when fresh. It takes more than 2 months to bear seeds. The plant is not a creeper and has no tendrils. It is a heavy cropper; three crops per year can be obtained from the ground. It has the power of obtaining nitrogen from the air and its cultivation enriches the soil. It can be easily, cheaply cultivated and procured easily. The plant is indigenous to Manchuria where soya bean forms a staple article of diet from time immemorial. The Manchurian peasantry are well aware of this amazing little plant and make a drink from it in a rough and ready fashion by mashing it up with a pestle and mortar and infusing it with hot water. The resulting liquid resembles milk, not only in appearance, but possesses nutritive properties similar to those of milk when ingested. It is a recognised fact that Manchurians, both adults and infants, thrive well upon it.

The dry seeds are yellow and oval with the hilum flattened, and they possess a thin greyish coloured tight-fitting skin through which the yellow colour of the cotyledon is seen. On account of this skin, the seeds can be stored and are well preserved indefinitely from contamination and transported easily. The seed contains aleurone granules mostly and some oil globules when examined under a microscope, and no starch granules as it does not react to iodine. The beans can be taken raw and fresh as they are sweet and agreeable to taste. They may be taken as a vegetable by soaking in water for 12 hours for the skin to come off and then boiling in salt water until they become soft and flavoured. The flour of the seeds is yellow and can be utilised as a gruel in broth or soups and can be made into biscuits and bread resembling gingerbread when mixed with a certain amount of wheat flour. As it contains no starch, soya bean can be used by diabetics freely and advantageously. Commercially, milk can be prepared from it as was done successfully during the Great War at Letchworth, cheaply and economically and without any risk of infection. The flour can be used to prepare scones, cakes, puddings, chocolates and cream. Ice cream can be prepared quickly and cheaply from it. As the curd formed from the milk prepared from these beans is soft, soluble, and assimilable, soya bean is superior to cow's milk in the dietary of infants, young children, sick and convalescent persons. Cheese can also be prepared from it. Hence the introduction of soya bean into the diet is the best way to insure a high degree of health and efficiency among Indians and has many advantages over meat and milk.



SUMMARY.

As undernutrition is the chief cause of lowered resistance and physical deficiency in India, especially among the poor who cannot afford to buy meat and milk in sufficient quantity, the introduction of soya bean liberally in their diet would be a boon to the community.

Among Hindus especially, vegetarians who do not use meat on account of religion, the introduction of soya bean in place of lentils has great advantages. As lentils are hard to digest, they cannot be taken in sufficient large quantity.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Secondly, the protein found in lentils is not completely assimilable as in milk, so a part of it undergoes putrefaction. Thirdly, lentils contain purin bodies, though less than in meat, and are hence objectionable. Lastly, lentils contain much starch, whereas soya bean contains none, hence soya bean is more suitable than lentils to go with a rice diet which is nearly all starch.

In a hot country like India one needs less food, particularly less meat, and among the well-to-do who take a large amount of meat the introduction of soya bean to replace a part of meat would diminish the ill effects of too much meat and thus help them to lessen the intake of meat. So both vegetarian and meat diets can be improved immensely by the introduction of soya bean, partly by taking the place of the inadequate supply of milk and partly by replacing meat without producing disadvantages of both. The ideal diet is a mixed diet containing milk and its products, fish, eggs, cereals including whole wheat bread, nuts, a liberal amount of green vegetables including soya bean, fruits and a minimum amount of meat.

Lastly, soya bean being rich in potash, lime and vitamins, is well suited for encouraging growth and maintaining the tissues in a state of health. A diet lacking in potash causes baldness and obesity, and a diet lacking in lime causes decay of the teeth. Soya bean, besides being a hard and solid food containing cellulose, requires chewing. This exercises the jaws and thus improves the condition of the tooth sockets and teeth and insures the flow of saliva and gastric juice. This bulky food not only satisfies hunger but helps to regulate the bowels, whereas concentrated food causes constipation. It should be emphasised as it is not generally recognised that even if enough food is ingested, undernutrition may occur if the food is not sufficiently varied. Organs and tissues require for the proper performance of their functions not only protein, starches and fats but also vitamins and certain nutrient salts, for example the thyroid requires iodine, the ovary and blood iron, the heart and teeth lime, the brain phosphorus, the bones lime and phosphorus, the hair sulphur, and the skin silicates. Hence a diet containing deficiency of vitamins and salts, by causing endocrine deficiency, may predispose tissues to the chronic infections so commonly observed among the people of India.

TATTOOING OF THE CORNEA WITH PLATINUM CHLORIDE SOLUTION FOR LEUCOMA.

By B. P. BANAJI, F.R.C.S.I.,
Taj Mahal Hotel, Bombay.

This method of colouring a leucoma black came into existence three years ago. Its technique has been described by Dr. G. Krautbauer, one of the assistants of Professor Axenfeld of Freiburg in the *Klinische Monatsblatter für Augenheilkunde* for March, 1928. Personally, I have found its use very satisfactory. The details of technique are as follows:—

1. Instillation of a cocaine-adrenalin solution, 4 per cent., about three times.
2. A quick washing out of the conjunctiva with sterile water (not saline) for a quarter of a minute.
3. Careful scraping of the epithelium over the leucoma with a von Graefe's knife, or a sharp spoon, not going deep. No washing after this.
4. Application of platinum chloride solution, 2 per cent., with a cotton swab (not dripping) for two minutes over the raw surface. For this purpose a thin wooden probe is wrapped round with cotton at its end, and only the foremost two-thirds is soaked in the solution. Then the point is applied with slight pressure to the raw surface of the leucoma. In this way the leucomatous surface is sufficiently impregnated, while the upper dry part of the cotton by its aspirating action will prevent any excess of the solution from dripping over the cornea.
5. Next drop from 8 to 10 drops of a 2 per cent. solution of hydracin hydrate over the spot for 20 to 25 seconds. (This solution should not be more than 4 weeks old.)
6. Immediately wash out the eye with sterile water to remove any excess of solution.

In about two minutes the reduction of the metal is complete, and the leucomatous area assumes a dark tint.

7. The conjunctival sac is then washed out with normal saline.
8. Boric ointment is applied and both eyes are bandaged for two days.

BREATH SUCKER SNAKES.

By KIDAR NATH DUTT, L.S.M.F.,
In charge, Canal Dispensary, Chandna, Bahawalpur State, S. P. Railway.

This variety of snake is fairly common in the desert Chalistan area of Bahawalpur State in the summer months from June to September. At first sight no one would believe that the snake has the habits which characterise it, but the writer has seen both the snake and its victims.

The snake does not bite, and has no fangs, but possesses a peculiar enmity to man. During the day time it is blind and harmless and can be easily handled. Often it can be traced to its hole in the ground by a peculiar mark which it leaves on the ground. At night time it will avoid a bright light, and for this reason officers touring this area surround their tents with barbed wire and keep a lamp burning inside all night. Others light fires to protect themselves against the attacks of the snake. It is said that its body is so elastic that it cannot be easily killed with blows of sticks, or *lathis*, and that the best method of destroying it is to throw it into the fire.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The snake is said to have a blister in its mouth, which irritates it, and it is to get rid of this that it attacks man.

At night and in the dark the snake enters human habitations when the inmates are asleep, and it is stated that its first action is to remove any articles with which it could be attacked, such as sticks, *lathis*, or shoes, away from the bedside of the sleeper. It then imperceptibly crawls on to its victim's chest (or, some say, on to his face only). In order to relieve the irritation of the blister in its mouth, it places its mouth over the mouth of the unconscious victim; then either the blister bursts, or the snake ejects some poison into the victim's mouth. Having accomplished its purpose, before leaving its victim, the snake awakens him with a forcible blow of its tail to see the end of his days. The snake has been seen by its victims escaping in the dark.

The venom is very fatal and acts in a very short time, the patient feeling a sweet taste in his mouth, then a choking sensation, then falling into a swoon from which recovery occurs in but very few cases. Some patients cry for help, and if vomiting can be induced they may recover. It is said that if a patient survives till daybreak he will die as soon as the sun rises, and that light is very inimical to the patient. To protect such patients from the light, people dig pits under ground and cover their mouths with bushes; others close all openings of their huts with mud.

Two drugs are commonly used in this locality for the treatment of such patients; (*i*) the first, the grease from the common Indian tobacco pipe (*hukka ki mal*): (*ii*) the second, copper sulphate dissolved in water. Both act as emetics. It is believed that if vomiting can be produced very early, the patient may live.

The time to death may depend upon the dose of poison injected. Many such persons who have gone to bed in perfect health and with no ailments whatever, have been found dead the next morning. The cause of death has been attributed to the "sucker snake," which has been definitely traced from the marks which it has left, and has been killed and identified. The writer has seen five such cases in which no trace of any bite or injury could be found on the body; in these cases he was summoned for help, but death had ensued before his arrival as long distances had to be covered to reach the patient's house in each instance.

I beg to request readers of this journal to supply information as to whether they have ever come across such a snake. One specimen of this snake has been preserved in spirit.

[*Note.*—We have shown the above account to Lieut.-Col. H. W. Acton, I.M.S., who urges us to publish it as typical of the legends and myths which gather around the subject of snake-bite in India. The snake is probably the perfectly harmless *Eryx johni*—John's earth snake, or the "two-headed snake," so-called from the fact that its head and tail resemble one another on a superficial examination. The qualities attributed to this snake all over India are of the most widely varied and picturesque order. This snake prefers sandy soils and frequently burrows near the roots of trees, where it lies in its burrow awaiting such prey as may come near, e.g., beetles, frogs, and small animals. It often attains a considerable length, e.g., 3 ft. to 3 ft. 6 inches. It is sluggish in its movements and very easily handled during the daytime.

We have asked the author to send us a specimen for identification, if possible. Meantime, we wonder how so detailed and so elaborate a legend can grow up around a harmless snake. We would like to make a present of this "sucker snake" to any novelist in search of really exciting material; its dramatic attack by night could be woven into a story worthy of "my dear Watson."—EDITOR, *I. M. G.*]

A Mirror of Hospital Practice.

AN INTERESTING CASE OF RECURRENT PREGNANCY TOXÆMIA.

By SUDHIR CHANDRA BOSE, B.SC., M.B.

MRS. P. an Anglo-Indian lady, 18 years old, full term, was admitted to the hospital on the 1st of July, 1923. Measurements of the pelvis were found to be normal. The vertex was presenting. Urine examination revealed excess of albumen. She complained of no pains and the head was not fixed though her expected date was the 1st of July. The systolic blood-pressure was 120 mm. of Hg. The patient looked perfectly healthy but complained of occasional headaches and sleeplessness and for this she had hypnotics. On the 5th, the urine was tested again and there was albumen in it. On the morning of the 7th July, i.e., 7 days beyond her time, she started to get pains but not very effective ones. At about midday, on finding the cervix fully dilated after a vaginal examination, the membranes were artificially ruptured but that did not improve the pains. The fœtal heart sounds were found quite good. Two hourly doses of grs. x. quinine were then administered orally for three doses. The fœtal heart sounds were counted every half hour, but after the last dose of quinine they gradually began to get slow and the mother also showed signs of exhaustion. Forceps were applied. The baby was born in a condition of white asphyxia with the cord once loose round its neck. All methods of resuscitation failed to revive the child and it died soon after. It was 7lb. 2 ozs. and the head was bigger than normal, the measurements of the head being:—

Circumference	14½ inches.
Bi-parietal	3¾ "
Bi-temporal	3½ "
Mento-vertical	6 "
Occipito-frontal	5 "
Suboccipito-bregmatic ..	4 "
Submento-bregmatic ..	4 "

The perineum was completely torn and the cervix was very badly lacerated. The puerperium was stormy for about ten days and a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

pure growth of *B. coli* was found in the urine on culture. The urine was examined twice during the puerperium and albumen was found on every occasion. The uterus was retroverted, but it was corrected with a ring pessary and the patient was discharged. She was definitely instructed to put herself under the care of a doctor from the third month onwards, if she happened to be pregnant again. These instructions she did not follow, but appeared for examination in 1924, when she was in her seventh month. The child was found lying breech foremost and the urine was loaded with albumen. A suitable diet mainly consisting of milk, vegetables, and vitamine-containing foods was drawn up for her and she was asked to keep to it. An *x*-ray examination showed that the child was lying with the breech over the internal os with a hydrocephalic head. On admission to the hospital on 17th August, 1924, when she was near term, the urine showed only a trace of albumen. She insisted on having a living child and wanted to have an abdominal section done. A classical Cæsarean section was accordingly performed on the 29th of July, and a baby with a spina bifida, hydrocephalus, and talipes was delivered. The child died 22 days after the delivery. The mother had an uneventful recovery. A urea concentration test was performed before discharge and the kidneys were found functioning normally but a slight trace of albumen was still present in the urine.

In 1925, she again became pregnant. She strictly followed the dietary ordered for her. There was no albumen in the urine. The second stage was helped with forceps in consequence of her having had a previous Cæsarean section. This happened in the Madras Maternity Hospital. The mother and the baby were both healthy at the time of leaving the hospital.

In 1927, she was admitted twice in the hospital—once on the 23rd of January, for threatened abortion, high fever, tonsillitis, and again on the 17th of February, for an inevitable abortion. The uterus was emptied and she was discharged on the 22nd of February. Her urine was not tested this time.

This year (1928) she was admitted to the hospital on the 9th of September, at full term. The head was presenting, not fixed and the fœtal heart sounds were quite good. She had her last period from the 15th to the 20th December, 1927. She was first seen in her third month and was asked to follow the diet strictly. The urine was examined and no albumen was found. On being admitted to the hospital her urine was tested again and there was a trace of albumen (nitric acid test being negative). Indican and phosphates were present and the specific gravity varied between 1,005 and 1,002. Acetone, bile, and diacetic acid were absent. On microscopic examination no casts were present but only epithelial cells, pus cells and bacteria were present. A urea-concentration test was done and the result was as under:—

1st specimen	..	1.2	per cent.
2nd specimen	..	1.9	„ „
3rd specimen	..	1.3	„ „
Blood urea ..	..	0.02	„ „

Wassermann reaction was found negative. The blood-pressure was recorded to be 118 mm. of Hg. systolic and 90 mm. of Hg. diastolic.

She insisted on a Cæsarean section and sterilisation at the same time. This time the head was found to be of quite normal size and the fœtal heart sounds good. On the 25th of September, a classical Cæsarean section was performed making a linear incision on the body of the uterus parallel to the former one. The previous uterine scar was found to be quite sound and there were no adhesions present, except some slight attachment of the omentum. The tubes were tied by the double loop method with silk. The uterine wound was sutured with silkworm gut and the omentum was placed behind the uterus. The mother made a speedy recovery without any post-partum complications and the baby also went out perfectly healthy.

I have ventured to record this case as all her pregnancies could be followed so accurately and as it is instructive in various ways.

This case is instructive for the following reasons:—

(1) That the castor oil, quinine, and pituitrin technique is not altogether safe, if the baby is post-mature. Post-maturity spells a bigger and harder head due to the increase in circumference of the head by ½ inch, every week after full term and also due to the deposit of calcium salts on the calvarium. This makes moulding difficult.

The dangers of supermoulding are much enhanced if the technique is followed after the membranes have already ruptured. Professor B. P. Watson records the fœtal death rate as 6 per cent. from a follow up of 195 cases and Dr. F. J. Browne 4 still births out of 44 cases—one of which was a large child in a primipara.

In this case either the quinine or the post-maturity or the albumen in the urine might have brought about placental infraction, the consequent fœtal anoxæmia pre-disposing to the death of the fœtus, but as forceps were used after many hours in the second stage and there was a complete rupture of the perineum, it supports the view of Ballantyne and Browne that "post-maturity itself, apart from large dimensions of the fœtus does not appear to be a cause of death, but the danger is concentrated in the intra-natal period when the child is passing or rather being dragged through the genital canal of the mother. The child dies at birth or soon

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

afterwards on account of injuries received therein."

It is very probable that the forceps caused intracranial hæmorrhage in this case.

Perhaps it will not be out of place to mention that quinine alone is supposed to be successful in bringing on labour in 66 per cent. of post-mature cases. Gellhorn records three cases of fœtal death following the quinine technique, but as no post-mortem was done on the babies nothing definite can be said.

If the kidneys are diseased the blood is unhealthy and therefore if conception takes place the ovum and the trophoblast are liable to be affected. Birnbaum says that nephritis of the mother either by toxic influence on the vessels, or by disease of the decidua or by failure in the supply of oxygen, or the effect of poisons—all predispose to either death of the fœtus and thus expulsion, or in some cases malformations, e.g., hydatidiform mole often occurs in conceptions during albuminuria.

In this case the mesoblast being supplied with blood contaminated by toxins the fœtus developed hydrocephalus; in other cases hydramnios, anencephaly or other monstrosities occur.

It is of interest to note that hydrocephalus is often complicated by spina bifidia, just as anencephalus is complicated by diseases of the adrenals.

(2) That the patient suffered in 1923 and 1924, from one of the mild forms of toxæmias of pregnancy where albuminuria was the main and only symptom. Now, however, the kidney efficiency tests show but slight derangement—thus proving that there is no permanent leak or lowering of the threshold for the passage of albumen.

Cruickshank, Hewitt and Couper classify these cases as the "albuminuric" type of toxæmia.

It will be observed that the patient did not develop eclampsia nor did she have any adherence or retention of placenta, in any of the pregnancies. This was possibly due to correct dieting.

(3) That despite all these accidents the patient conceived again.

The history of the other conceptions, especially the second, should warn us to put the patient on diet early, or as Col. Green-Armytage puts it, "at the time of the embedding of the ovum, when the tissues of the endometrium are digested and eroded by the trophoblast and the end products are thrown into the circulation.....the ovum in its growth and maintenance is a parasite not only drawing on the mother's capital but actually injuring her in many ways."

(4) That it also emphasises the general maxim that "Every woman must be examined after delivery as to the condition and position of the uterus before she is discharged." By following this, one can save a woman from the bitter and lasting symptoms of acquired retroversion, prolapse and inflammation. An insertion of a ring or Hodge pessary after correcting the position of the uterus which can be discarded after 2 or 3 weeks, and a course of tonics can easily accomplish this.

(5) This case also points out the fallacy of the statement "Once a Cæsarean, always a Cæsarean." Nowadays repeated sections are only indicated in those cases where there is a permanent marked degree of pelvic contraction. It is considered only fair that a patient who has a borderline contraction of the pelvis or who has a normal puerperium in the former section should be given a fair trial, to deliver herself naturally by the vaginal route. But the second stage should be carefully watched and assisted either with anæsthesia or forceps. Pituitrin is to be avoided for the reason that it strains the continuity of the former scar.

(6) The question of sterilisation after Cæsarean section is a moot point: our views are that if there is an organic disease or permanent deformity, sterilisation ought to be done after the birth of the second living baby. If sterilisation is deferred, the dangers of subsequent delivery should be explained to the patient and her husband.

(7) That silkworm gut is the best suture material to be used in Cæsarean section cases according to Eardly Holland, as the former Cæsarean scar was found perfectly sound though an incision of about 7 inches had been made in the uterus in order to deliver the hydrocephalic child.

That where repeated sections are to be performed the classical Cæsarean is the most suitable.

(8) That the urea-concentration test gives very valuable information as to the question of the future diet and welfare of the patient.

My thanks are due to Lt.-Col. V. B. Green-Armytage, M.D., F.R.C.P., I.M.S., our present chief in the Eden Hospital, for kindly permitting me to publish the record of this case, and to Dr. M. Sarkar, Registrar, Eden Hospital for kindly giving me the necessary suggestions.

REFERENCES.

(1) F. J. Browne and Prof. B. P. Watson. *Transactions of Edinburgh Obs. Society*, Vol. XLIV.

(2) P. Conan and Owen Jones. *The Journ. of Obs. and Gynæ. of the British Empire*, Spring, 1927.

(3) G. Gellhorn. *The Amer. Journ. of Obs. and Gynæ.*, June, 1927.

(4) Birnbaum and Blacker. *Malformations of the Fœtus.*

(5) J. N. Cruickshank, J. Hewitt and K. L. Couper. The Toxæmias of Pregnancy. *Special Report Series No.* 117.

(6) V. B. Green-Armytage. *Tropical Midwifery.*

(7) V. J. Harding. *The Journ. of Obs. and Gynæ. of the British Empire* Spring.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(8) R. H. Paramore. *The Journ. of Obs. and Gynæ. of the British Empire*, Summer, 1928.
(9) R. D. Mussey. *The Amer. Journ. of Obs. and Gynæ.*, June, 1925.
(10) V. B. Green-Armytage. *Tropical Gynæcology.*
(11) Welz. *Amer. Journ. of Obs. and Gynæ.*, March, 1927.
(12) Montgomery. *Amer. Journ. of Obs. and Gynæ.*, May, 1927.
(13) Lull. *Amer. Journ. of Obs. and Gynæ.*, May, 1927.
(14) Stuckert. *Amer. Journ. of Obs. and Gynæ.*, May, 1927.
(15) Gladden. *Amer. Journ. of Obs. and Gynæ.*, May, 1926.
(16) Wilson. *Amer. Journ. of Obs. and Gynæ.*, August, 1926.
(17) Schwartz. *Amer. Journ. of Obs. and Gynæ.*, March, 1927.
(18) Astley. *Amer. Journ. of Obs. and Gynæ.*, January, 1927.
(19) Aleck Bourne. *Recent Advances in Obs. and Gynæcology.*

AN UNUSUAL COMPLICATION OF KALA-AZAR.

By NISANATH GHOSH, M.B.,
Teacher, Medical School, Dibrugarh, Assam.

IN 1926, the writer of this note came across a kala-azar patient with a rare complication—gangrene of the scrotum.

The patient, a Muhammadan male aged about 24 years, was undergoing urea-stibamine treatment for kala-azar. He was a bit negligent about his personal cleanliness. One day while scaling over a low bamboo fencing he had a trifling scratch on his scrotum. In a few days ulceration and gangrene rapidly followed in spite of the usual treatment, and when one side of the scrotal sac was lost leaving one testis exposed, the destructive process ceased and eventually the patient recovered both from the complication as well as from the original trouble.

Years ago, Sir Leonard Rogers observed that about 17 per cent. of kala-azar cases get cancrum oris and that sloughing of the scrotum had also been noticed. Dr. U. N. Brahmachari mentions gangrene of the vulva. Recent research workers like Dr. Napier are of opinion that nowadays, with a better sense of personal hygiene and under more enlightened conditions, the percentage of cancrum oris has dropped down to 2 per cent. only. In this particular case just mentioned, the dirty habits of the patient and the trifling scratch perhaps gave a start to the gangrenous process at an unusual spot.

A CASE OF IVORY-GRAFTING

By S. C. DAS GUPTA, L.M.S.,
Senior Surgeon, Bir-Hospital, Nepal.

A HINDU boy aged 6, was admitted in August, 1926, having a compound comminuted fracture of the left femur, which for want of proper treatment became septic. Under choloroform I enlarged the opening and also made a counter-opening at the most dependent part, as the cavity was full of pus having no means of outlet, and then kept the wound continuously irrigated by Carrel's method for a few days, but to no purpose. The boy was running a high temperature daily and also having a profuse discharge of pus from the wound; so after a week I again had the patient under chloroform and removed all the loose fragments of the bone and at the same time the upper and the lower ends of the fragments were sawn off by means of a motor saw—the soft parts having been carefully protected from injury. There was a

gap of nearly 5 inches between the ends of the bone. The cavity was then scraped out, irrigated, dressed and put between two side-splints. In six weeks the wound was completely healed up and the general condition of the patient also greatly improved, but the limb was a mere flail and consequently useless.

Then I had a round piece of ivory made; 6 inches in length and about ¼ inch larger in diameter in comparison with the removed pieces of bone. I kept it immersed in absolute alcohol for twenty-four hours. Next, I made a longitudinal incision about 7 inches long at the outer part of the thigh and deepened the wound up to the level of the bone and exposed both the ends of the femur. I scraped out the medullary cavity for ½ inch on each side and fitted the ivory piece after traction made on the part from the opposite sides—the narrowed ends entering into the medullary cavities. The lower end fitted

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

all right, but the upper end was a little loose. So I had the junction of the ivory piece and the bone surrounded by a narrow silver plate and screwed into it. Then the muscles and fascia were sewn together over the graft fairly tight, and the skin was sutured with interrupted silkworm-gut stitches, and the limb was then fixed up in splints. On the 10th day the stitches were removed and after a week the limb was put up in plaster of Paris, which was kept on for two months. On removal of the plaster the graft was found slightly movable, so I applied plaster of Paris again. I removed the same after three months—when the graft was found immovable, and on finding the knee joint stiff I had the limb massaged daily. At this time the boy could stand on both legs with slight support, but could not bear the whole weight of the body on the affected leg only. A month later he could stand well and even walk a few steps with the aid of a stick. After 9 months the boy could go up and down the stairs by holding the bar of the staircase.

I enclose a photograph showing the condition of the patient on 1st March, 1927. The boy came to me several times and I saw him last about a week ago; he can now walk easily half a mile unaided and swim also. The shortening of the operated on leg is only three-quarters of an inch since the operation, i.e., in the course of nearly two years.

My thanks are due to Captain Kaisar Jung Thapa, Radiologist and to Dr. Sidhi Mani Acharya, M.B., for their valuable assistance.

NOTES ON A CASE OF *BACILLUS COLI* SEPTICÆMIA.

By A. BAYLEY DE CASTRO,
LIEUT., I.M.D.,
Military Family Hospital, Quetta.

THESE notes are published because of the rarity of such cases in non-debilitated subjects, and also because of the long and protracted course that the disease may take.

Mrs. B., wife of a sergeant of the 1st Royal Welch Fusiliers, aged 32, and the mother of two children, was admitted into the Military Family Hospital, Quetta, on the 22nd September, 1928 complaining of headache, anorexia, and lethargy, which had started on the 6th September, 1928. She never took her temperature at home but thought she got a slight pyrexia at some time daily. She presented a dull expression, and had a dry, brown, coated tongue, with the tip bright red and strawberry-like. She had been reinoculated against enteric fever on the 4th August, 1928. The liver and spleen were not palpable, and no adventitious sounds were heard in the heart or lungs. Slight tenderness and pain on deep palpation were present over the right renal region, and slight pain on micturition. No backache. At the time of admission she was menstruating very profusely but stated that that was her normal period.

She had lived in India for a total of 3 years, and arrived in Quetta from Nasirabad in February 1928. She had her last confinement at Nasirabad in November 1927, the labour was difficult and prolonged, and there was profuse post-partum hæmorrhage. In December, a few days after discharge from hospital, she developed mild scarlet fever.

She gave a negative history to any kidney or bowel trouble, which is interesting from an ætiological standpoint. Her dentures were defective and gums unhealthy, and four stumps were extracted on the 12th October, 1928.

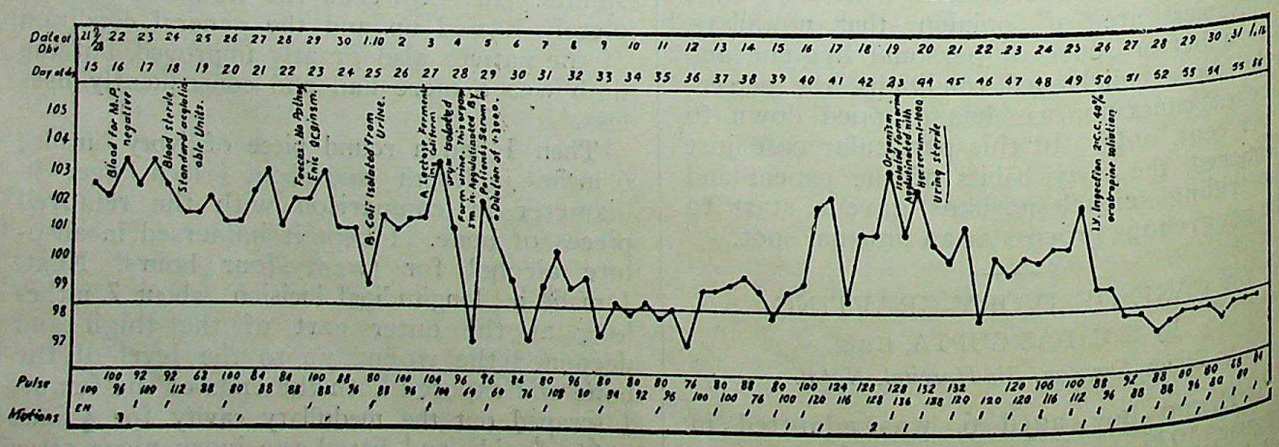
Before admission to hospital she had repeated attacks of urticaria, and during the period of her admission had several attacks also. Blood smears examined for malaria parasites were negative. The blood for Widal reaction showed standard agglutination value: (T. 7, A. 13, B. 9). The fæces showed no pathogenic organisms, but the urine showed a heavy *B. coli* infection. The report from the laboratory stated that "a lactose-fermenting coliform organism was isolated from the urine, and this organism is agglutinated by the patient's serum in a dilution of 1: 3,000" (See notes on temperature chart). The blood was sterile on culture.

In the early stages of patient's stay in hospital, rigors, and profuse diaphoresis were marked features of the disease, and these attacks were specially severe on the 22nd, 23rd, and 30th September and the 4th and 5th of October. Most of the rigors and sweats occurred at night, but this was by no means the rigid rule. The treatment from the date of the first laboratory report was a mixture of ½-drachm doses of hexamine and acid sodium phosphate in an ounce of water t.d.s., prior to which intramuscular injections of quinine in doses of xv grs. had been given.

On the 5th October, 1928, 30 c.c. of freshly prepared eusol solution was given intravenously, with gratifying results: (see chart).

On the 8th October, 1928, another dose of these injections was to have been given but her veins were found collapsed, owing to very profuse diaphoresis.

On the 9th October for the first time since admission the headache had disappeared.



On the evening of the 16th October the temperature shot up again and on the 17th a 40 c.c. intravenous injection of eusol was given. A pyelitis was suspected

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

but no pus was found in the urine, and unfortunately no culture was made from the gum pockets after the extraction of the stumps.

The laboratory report on the 20th October, 1928, stated that the urine was sterile, although this was about the middle of the period of her second relapse, which is difficult to account for; but finally on the 26th October she was given 2 c.c. of a 40 per cent. solution of urotropine with very striking results, and from now onwards rapid convalescence ensued and on the 1st November the patient was discharged from hospital.

Discussion. The salient features in the case are:—

(*a*) *Source of infection.* Was a mild pyelitis present and was that responsible? It is said that these organisms filter through the gut into the kidneys. Be it remembered however that this patient gave a negative history to any bowel complaint. Was the condition of the gums the source?

(*b*) *Course of the disease and laboratory findings.* In conjunction these two factors are of interest, though it is difficult to account for the relapse. Thus on the 3rd October, 1928, the laboratory reported the finding of lactose-fermenting coliform organisms from the urine which agglutinated by the patient's serum in a dilution of 1:3,000; and on the 19th October, 1928 this dilution figure was reduced to 1:1,000 (*see* chart). Finally the urine was found to be sterile on the 20th October, 1928.

(*c*) *The long course of the disease.*

AN INTERESTING EARLY RIGHT-SIDED GOITRE.

(*With a mild paratyphosus A complication.*)

By Lieut. A. BAYLEY DE CASTRO, I.M.D.,

Military Family Hospital, Quetta.

THIS case presented certain features of interest, both in the patient and the train of symptoms she developed.

Mrs. S., a well developed, and healthy looking woman, first came under my observation in June 1928, when she attended the out-patient department of the Military Family Hospital for the treatment of her goitre.

In January 1928 she had received protective inoculation against enteric fever in London. In March she arrived in India, her first station being Jubbulpore, and finally she arrived in Quetta in June of the same year.

Her chief complaint then was palpitation and insomnia. Breathlessness was not complained of. An acceleration of the pulse was often noticed. The area of cardiac dullness was not increased, and the blood pressure was normal.

The goitre was at first the size of half a cricket ball and had developed from the right lobe of the thyroid, but a week after her third injection of sodium iodide it had diminished to some extent. Unfortunately at this period she developed a neurotic tendency, and I fear—influenced by her husband—started discrediting the treatment.

Nervous System.—The right pupil was more dilated than the left, and the voice was turning hoarse, which factors indicated pressure on the right cervical sympathetic and recurrent laryngeal nerves. All reflexes were brisk, but not pathological. The plantar reflex was flexor. Optic discs normal.

In connection with the goitre, the past history of the patient is of some interest to adherents of the intestinal toxæmic theory. During her girlhood and especially between the ages of 5 and 9 years she suffered from a "weak stomach" and during all this time attended the Great Ormond Street Hospital. The symptoms of this "weak stomach" as described by her, were pain and vomiting, she does not remember any diarrhœa. Even now when it gets cold or damp she suffers from abdominal colic. She married at the age of 20, and a year later the goitre became very noticeable. Her father died at the age of 52 from a heart affection following rheumatic fever. There is insanity in the family on the father's side. Apart from this the family history is negative. According to the patient's statement she felt ill on the 4th August 1928 for the first time since coming to India, and on the 7th, after running a temperature at home for 3 days was admitted to hospital. Five c.c. of blood for culture sent to the laboratory was reported on the 11th to show *B. paratyphosus A*, which according to Manson is the most common enteric infection in India.

The pyrexial period of the disease was remarkably mild. On the 14th August, however, the patient suddenly developed a pain in the right wrist and forearm, and next day there was a distinct swelling on the palmar aspect of the wrist, while careful palpation made evident a teno-synovitis with a myositis of the muscles. The next day the left elbow was painful, but not to the same degree as the right wrist, which for two nights caused disturbed rest. The pain in the left elbow disappeared completely in 48 hours, but that in the right wrist not till the 22nd August 1928.

The urine, examined on several occasions, was never found to be excessively acid.

The patient was discharged on the 15th September 1928, but shortly after began to suffer from headaches and backaches. She was unable to perform her household duties, and suffered from a weakness of the right arm. The grip of the right hand was weaker than that of the left, and a weakness of the lower extremities had also developed. She was finally invalided and left for the United Kingdom on 21st November 1928, and so I lost touch with her.

APYREXIAL PNEUMONIA.

By U. A. KRISHNA IYER.

L. F. Dispensary, Jammalamadugu.

APYREXIAL pneumonia is not an uncommon occurrence in general practice. Some of the sudden deaths after two days' slight fever might be the result of such a condition. Unless every such case is subjected to a post-mortem examination, the rate of actual death from the pneumonia cannot be correctly estimated.

Case No. 1.—A middle-aged man of about 35, previously hale and healthy, was seized at about 3 a.m. one morning with a slight pain in the chest. By 6 a.m. the pain became severe and he was just preparing to start for the out-patient clinic when he got an attack of sudden pain and had to lie down. There followed some convulsive movements of the body with eye-balls

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

rolling, struggling of arms and legs, foaming at the mouth, and in a few minutes, he was dead. On post-mortem examination there were typical signs of pneumonia of one lung, the beginning of grey hepatization. His condition before post-mortem examination never gave even the slightest clue that he was suffering from pneumonia. The temperature soon after (10 minutes after) death was 100°F. But for the post-mortem examination, his death would have been classified under some fit of cerebral origin.

Case No. 2.—Patient aged about 30 had attended the out-patient clinic the previous day for slight fever and headache. He was given the routine mixture for fever (diaphoretic) and sent away. He worked that day. Just before meal-time, at about noon, he was going to take his food, but on the way fell down fainting and, before anything could be done, expired. But for the post-mortem examination which revealed definite signs of pneumonia just like the first case, he too would have been considered to have died of heart-failure due to, say, "flu."

AN INTERESTING CASE OF "CHOREA."

By S. B. IMAM,

Medical Officer, Khutowna Dispensary (Darbhanga).

A BRAHMIN girl, aged about 9 years, was brought to me from a village in the vicinity of the Nepal border for the treatment of constant sucking movements of the lips, protrusion of the tongue at frequent intervals, and certain awkward movements of the limbs.

Having thoroughly watched the symptoms I concluded that they quite tallied with the book symptoms of chorea.

The intense anæmia, the frequent abdominal pain and the lowered general health of the girl suggested to me that she must be suffering from some worm infection too. On enquiry from the father of the girl I was told that the girl had passed a big "Chali" (round-worm) some two months ago.

I first determined to get the girl freed from the worm infection, and then later on to give her salicylates, arsenic and bromides for chorea.

With this idea she was provided with an ordinary worm powder containing half a grain of santonine.

Four days after I was informed by her father that she had passed some fifty worms in the stool, and that all the other symptoms, viz., sucking movement of the lips, protrusion of the tongue and awkward movements, had ceased.

Having been struck with this information I requested him to bring the girl to the dispensary. The girl was brought to me a week after and to my surprise I found her quite well.

The idea of my writing this article is to show that simply half a grain of santonine could check all the choreic symptoms and hence I conclude that Ascaris infection can also be one of the exciting causes of chorea.

A CASE OF INGUINAL HERNIA WITH A FÆCAL TUMOUR IN THE SCROTUM.

By D. N. GHOSE, M.B., B.S.,

AND

A. K. MITTER, M.B., B.S.

118, *Lukergunj, Allahabad.*

M., an old man aged about 60 years was admitted to the Colvin Hospital, Allahabad, on the 22 November, 1928, with the complaint of slight abdominal discomfort, nausea, loss of appetite and chronic constipation. He said he had been suffering from this condition for the last 3 months and that his constipation was gradually getting worse every day. He had tried all sorts of purgatives but without any avail.

Though old, he was not constitutionally weak and had kept very good health till the onset of this trouble. On physical examination his tongue was found thickly coated, abdomen slightly tumid but soft. No gland or growth could be detected within the abdomen. Liver and spleen were normal, heart sounds were rather feeble and pulse of low-tension. The only thing found on examination was that he had double-sided inguinal herniæ; on the right side it was only a bubonocele, whereas on the left side it was a scrotal hernia complicated with a fairly big tumour situated about the middle of the cord. The tumour, he said, was only three months old and had gradually grown to the present size. The tumour appeared neither connected with the testis nor with the contents of the hernial sac, which, however, could easily be reduced with a gurgle, indicating the presence of loops of intestine. The tumour was as hard as a stone and was about the size of a cricket ball, freely movable and seemed not adherent to any structure. The testis on that side was little, atrophied, and had lost its testicular sensation. The cord was normal and was quite separate from the tumour. As the patient was an old man and as he remarked that with the growth of the tumour his constipation became more and more acute, we were naturally led to think that it was some kind of malignant growth pressing upon the loops of intestines in the sac, causing obstruction to the onward passage of fæcal substance. At the same time we were at a loss to understand how it could cause obstruction when the intestines could apparently be reduced.

At this stage, that is on the third day after the patient's admission in the hospital, his

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

condition became very serious, so much so that he developed hiccough, began to vomit, and showed signs of acute abdomen in spite of high rectal enemata and fractional doses of calomel which he had had from the very day of his admission. The condition of his heart became so very unsatisfactory that operation, which was at one time supposed to be the only way of relieving his symptoms, could not be undertaken without the risk of sacrificing the patient's life, besides, the patient himself did not submit to operation and preferred the palliative treatment.

On the fifth day of the patient's hospital life, the mass, to our great astonishment, was found double instead of being single and its consistency was undoubtedly much softer than before, so much so that it began to pit on pressure. Next day the patient passed a few scybala with the soap water enema and his condition improved a little. The diagnosis was now clear, the tumour which had been mistaken for a neoplasm was nothing but a fæcal concretion, lodged in one of the loops of the intestine, although their apparent reduction gave us the false impression of the tumour being not connected with them. Now the patient progressed with the passage of a more and more scybalous stool every time, with the ultimate result that his constipation turned into diarrhœa. The mass had now entirely gone and all his symptoms subsided. The patient was discharged cured and was advised to put on a truss for the rest of his life as he did not like to undergo any operation.

Our best thanks are due to our chief, Dr. B. K. Mukerji, Medical Officer in-charge of the Colvin Hospital, Allahabad, for allowing us to publish this case and for helping us throughout its investigation.

A CASE OF EXFOLIATIVE DERMATITIS AFTER NEOSALVARSAN INJECTIONS.

By INDULAL S. DAVE, M.B., B.S.

Medical Officer, Jamnabai Dispensary and Maternity Home, Baroda City.

A Sadhu woman aged about 25 years attended my outpatient clinic in January 1928. She gave a history of a succession of eleven miscarriages without any conception having gone to term. On inquiry, she gave a history of her husband having suffered from syphilis before marriage. She was, therefore, advised anti-syphilitic treatment with neosalvarsan injections, both for her husband and for herself. But at first they refused. Then on the 3rd March, 1928, the husband came first to take the treatment. The wife also followed the next day. The following doses were injected intravenously into the patient on dates noted against each.

9-3-1928	.. ..	0.3 grm.
15-3-1928	.. ..	0.3 grm.
22-3-1928	.. ..	0.3 grm.
9-4-1928	.. ..	0.45 grm.
	Total:	1.35 grms.

Thereafter the woman refused any more injections, as she thought she was carrying, because she had missed one period.

On 22-5-1928, i.e., exactly six weeks after the last injection, she was brought to my clinic with the cuticle peeling off the skin at many places, in large areas of both upper and lower extremities and of the abdomen. At some of the places deep extensive ulcers also had formed by secondary infection due to scratching.

The history given by her husband was that about a fortnight after her last injection she got a macular rash which gradually spread all over the body. First, they mistook it for urticaria but when it persisted they took it to be measles. They did not take any treatment according to their religious belief. But when, after a fortnight of the rash, they saw the cuticle peeling off the skin and ulcers forming underneath, they gave her indigenous treatment. The patient was run down due to lack of nourishment and discharge of pus from an extensive raw surface. Ulcers formed in the mouth and the gums became spongy and pyorrhœa alveolaris set up.

In such a debilitated condition the patient was admitted into my wards.

As nearly a month had passed since the rash appeared first, and as urine examination did not give any indication of kidney trouble, I did not deem it desirable to give specific injections of sodii thiosulphate. I simply put her on to the following:—

℞	Tinct. Card. Co.	ʒi.
	Tinct. Cinchona Co. ..	ʒi.
	Tinct. Nux Vomica ..	m.xv.
	Mist. Saline (J. J. Hospital formula)	ad ℥iii.
	Fiat mist., ℥i. t.d.s.	

The ulcers were thoroughly washed antiseptically and dressed with an ointment of oxide of zinc. The mouth was attented to. She had to be fed with the spoon. During her stay in the hospital she went on improving daily and on 29-5-28, i.e., exactly on the 8th day after admission, she was discharged cured, though with a disfigurement of the body due to extensive white scars.

I have given about 400 injections of neosalvarsan intravenously to patients of several grades in society and of ages from 1 year to 50 years, but never have I seen a similar case of arsenical poisoning. The case very much resembles the one reported in the July 1928 number of the *Indian Medical Gazette* by Sanocrysin injection, with the difference that my patient survived and was cured fully without any intensive treatment.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A CASE OF A RUBBER CATHETER INSIDE THE BLADDER.

By A. K. DUTT GUPTA, M.B., D.T.M.
Assistant Surgeon, Medical College Hospital, Calcutta.

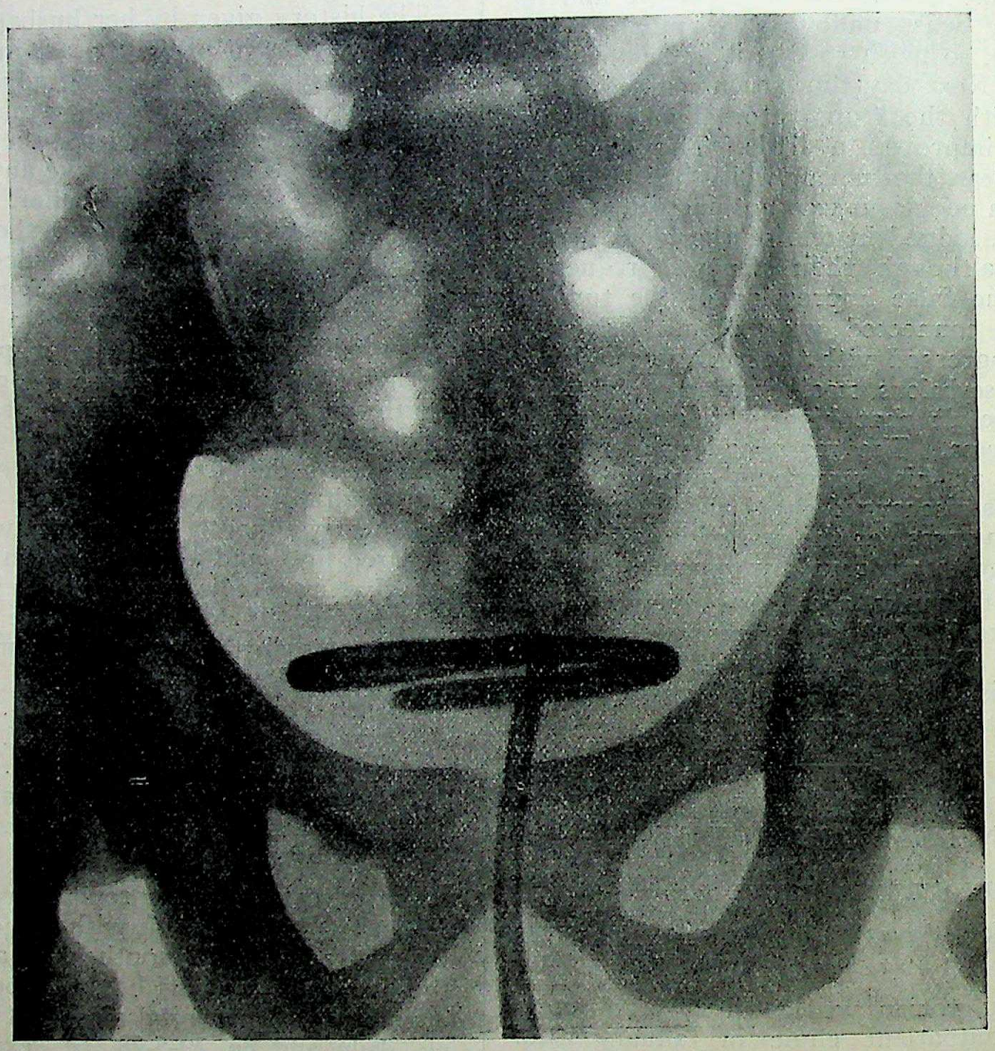
CASES of broken rubber catheters in the bladder are not rare, but the story of a whole catheter being "sucked into" the bladder before the wondering eyes of a doctor during the process of evacuation is perhaps an exceptional one.

The history is that a patient aged 40 years had retention of urine after a short attack of fever and a rubber catheter was passed by the local doctor to relieve the bladder. About an inch and a half of the catheter was outside the external urethral meatus. Towards the end, the doctor was making suprapubic pressure to expel last portions of urine, and, on relieving the pressure, to his utter amazement the catheter seemed to have been "sucked into" the bladder. An attempt at removing it proved fruitless.

The patient was admitted into the hospital 4 days after the accident. The end of the catheter could then be felt in the perineum behind the scrotum.

With a direct vision urethroscope the end was seen about 5 inches from the meatus, and with a pair of crocodile forceps the catheter was pulled out.

The catheter was a fairly new one, No. 9 size, and about 16½ inches long. The patient had no stricture in the urethra, which was of normal length. The skiagram showed that the forepart of the catheter was coiled one and half times inside the bladder. It seems probable that a few inches of the catheter was inside the bladder and had been coiled by the suprapubic pressure. On cessation of pressure, the catheter uncoiled partially and then by its elasticity drew in the other end.



My grateful thanks are due to Lt.-Col. Harnett, I.M.S., under whose care the patient was, for permission to publish these notes.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS. (By Mail).

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones. The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.

Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

OPOCRIN HEPAR.

Special liver extract for Pernicious Anæmia, Antitoxic effects, to favour intracellular absorption of Glucose, and for diabetes when due to defective functioning of the liver.

Price, bottle of 50 pills Rs. 3.

ONE GRAMME CREOSAL CONTAINS

Gualacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

For COUGHS whatever their origin

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

Send 8 As. stamps "for large sample bottle."

CREOSAL A.F.D. has none of the inconveniences of Gualacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY. Telegrams: P. O. Box 7861, CALCUTTA.
P. O. Box 226, MADRAS. "AMPSALVAS." P. O. Box 134, RANGOON

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

APRIL.

NOTIFICATION OF DANGEROUS DISEASES.

WE have received from the Honorary Secretary of the All-India Medical Association a copy of a "Bill for the Prevention of Dangerous Diseases," which Dr. Kumud Sankar Ray, M.A., B.SC., M.B., CH.B. (Edin.), has introduced in the Legislative Council, Bengal, and which has been referred to a Select Committee.

The text of the bill is as follows:

PREVENTION OF DANGEROUS DISEASES ACT, 1928.

INTRODUCED BY

Dr. KUMUD SANKAR RAY, M.A., B.SC., M.B., CH.B., (Edinburgh),

Member, Legislative Council, Bengal.

BENGAL ACT NO. OF 192 .

PREVENTION OF DANGEROUS DISEASES ACT 192 .

Whereas it is expedient to provide for the control and prevention of dangerous diseases in Bengal, it is hereby enacted as follows:—

1. (*i*) This Act may be called the "Prevention of Dangerous Diseases Act."

(*ii*) It extends to the whole of Bengal (except places where the Calcutta Municipal Act, 1923 is in force).

(*iii*) It shall come into force on

2. For the purposes of this Act, unless there is anything repugnant in the subject or context,

(*a*) Dangerous diseases mean

(*i*) Cholera; Plague; Smallpox; Cerebrospinal Meningitis; Diphtheria; Open Tuberculosis; and

(*ii*) Any other epidemic, endemic or infectious disease which the Local Government may, by notification in the *Calcutta Gazette*, declare to be a dangerous disease for the purposes of this Act.

3. Every medical practitioner who, in the course of his practice, becomes cognizant of the existence of any dangerous disease in any private or public dwelling-house, other than a public hospital, shall give information of the same with the least practicable delay to the President of the Union, Panchayet or Chairman of the Municipality or the Health Officer, within whose jurisdiction the disease happens to occur in such form and with such details as the Local Government may direct from time to time.

4. The President of the Union, Panchayet or the Chairman of the Municipality or the Health Officer or any officer employed and authorised by the aforesaid in their behalf may at any time by day or by night without notice or by giving such notice of his intention as may in the circumstances appear to him to be reasonable, inspect any place within his jurisdiction in which any dangerous disease is reported or suspected to exist and take such measures as he may think fit to prevent the spread of the said disease beyond such place.

5. (*i*) If it appears to the President of the Union, Panchayet or the Chairman of the Municipality or the Health Officer that the water in any well, tank, or other place within his jurisdiction, is likely, if used for the purposes of drinking or for any other domestic purpose, to endanger or cause the spread of any dangerous disease, he may, by public notice, prohibit the removal or use of the said water for such purpose.

(*ii*) No person shall remove or use for such purpose any water in respect of which any such public notice has been issued.

6. If the President of the Union Board, or the Chairman of the Municipality or the Health Officer or any officer authorised by the aforesaid on their behalf, is of opinion that the cleansing or disinfecting of any building or any part of a building or any article therein which is likely to retain infection, or any tank, pool, or well adjacent to a building, would tend to prevent or check the spread of any dangerous disease, he may cleanse, disinfect such building, part, article, tank, pool, or well and may by written notice require the occupier of such building or any part thereof to vacate the same for such time as may be prescribed in such notice.

(*ii*) The cost of cleansing or disinfecting any building or part thereof or any article therein under sub-section (*i*) shall be paid by the occupier of such building and the cost of cleansing or disinfecting any tank, pool or well, under the said sub-section shall be paid by the person in actual possession of such tank, pool or well, or if there be no such person by the owner thereof.

Provided that if, in the opinion of the President of the Union, Panchayet or the Chairman of the Municipality or the Health Officer, the owner or occupier is from poverty unable to pay the said cost, the President of the Union, Panchayet, or the Chairman of the Municipality, or the Health Officer may direct payment thereof from the funds at their disposal.

7. The President of any Union Board, or the Chairman of any Municipality, or the Health Officer may give a reward of any sum not exceeding one rupee to any person giving information about the existence of any dangerous disease at any place within his jurisdiction.

8. It shall be competent for the Local Government to prescribe from time to time what diseases are to be deemed dangerous diseases for purposes of this Act and to publish the same in the *Calcutta Gazette* and to prescribe the form and details to be supplied by medical practitioners under section 3 of the Act.

9. Whoever knowingly contravenes the provision of this Act shall be liable to pay a fine not exceeding Rs. 25.

Statement of Objects and Reasons.

The incidence of infectious and epidemic diseases in Bengal is very high. Every year a large number of people fall victims to the ravages of these diseases, which, under proper control, have been greatly reduced in other countries. The control and prevention of such diseases in this province are an immediate necessity. Prompt supply of information about the existence of any such disease to the authorities in charge of sanitation concerned, particularly from medical men who are conversant with the causes and effect of diseases, should be ensured; and the said authorities should have more powers of control for enforcing notification, so that necessary preventive measures may be taken with the least possible delay. It is with these objects in view that the Bill has been introduced.

Dr. Ray's bill embodies at least one very sound fundamental sanitary doctrine . . . it proposes to lay the foundation of securing, or attempting to secure, some real information about the incidence of infectious disease in the municipal and rural districts of Bengal.

Public Health in England had its beginnings in the years immediately following the Great Plague. At the very name "plague" the whole of London was terror-stricken; the Court, the Government and everybody who could fled from London, until the sane persons

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

asked "What, after all, is this Plague, what damage is it really doing, and what does the actual danger to which we are submitted amount to?" Captain John Graunt stepped into the breach and attempted to answer the question in his interesting and unique studies of the "London Bills of Mortality." In these he showed that the ravages of plague were not so bad as people thought and that a careful study of actual happenings, though it might not deprive the disease of its terrors, at least showed the problem in its proper perspective, and pointed the way to remedy and prevention. From that time the collection of accurate information concerning infectious disease has been one of the main planks in the English sanitary platform. Dr. William Farr showed to all the world to what great uses correct statistical information could be put; common sense and critical reasoning applied to accurate information led to a correct appreciation of the situation; the distribution of disease, its nature and extent, and the probability of its course could be appreciated, remedies devised and put into practice. Dr. William Farr's and Sir John Simon's reports did more than anything else to make public health in England a subject of national interest, and they had one basis, namely, correct information.

In India, the lack of this is one of our greatest disabilities. We have, it is true, some idea of extent of the main diseases like cholera and smallpox, but the real incidence of malaria, enteric fever, tuberculosis, leprosy, dysentery, and diseases like diphtheria, measles, whooping cough, etc., is really comparatively unknown. The sanitary law is vague and shadowy, and still feeling its way. In Bengal, for instance, outside Calcutta, there is no compulsory notification of any disease by anyone. The police are required to give information of any cases of cholera to the medical authorities, and special measures may be put into force for plague—a disease from which Bengal is particularly free. The village chowkidars on Rs. 12 a month as a matter of fact give valuable information of all sorts to the village Unions and District Boards, but in rural municipalities information about everything sanitary is sadly lacking. The notification of common occurrences, such as births and deaths, which is compulsory under law, is from 20 to 50 per cent. in deficiency. What hope then is there of any information about diphtheria, tuberculosis, enteric fever, or even smallpox and cholera being obtained! The Calcutta Municipal Act of 1923, however, marked a distinct advance. In this, certain dangerous diseases (cholera, plague, smallpox, cerebrospinal fever, and diphtheria) are made notifiable by registered practitioners, and the health officer may take such action as he thinks necessary for isolation and disinfection. The real value of this information and the value of the measures taken, or possible, as the result of the knowledge is still a matter of conjecture. What the sanitarian hopes for is an increase in the number of those who will have eyes to see and ears to hear; it is his aim to have the picture that he wishes them to see and appreciate always true and never false, so that when the scales fall, the public and their responsible advisors will see actual happenings, and through these the real causes and possible salvation.

There are one or two features in the Bill which appear to call for criticism. For example, take section 4. Will the ordinary Bengali householder permit the health authorities—not necessarily the Health Officer, but anybody appointed by the President of the District Board—to inspect his house "at any time of the day or night without notice"? Again section 7 seems to us open to abuse, "any person" anxious to earn a rupee might resort to it. These are in any case only minor objections to the Bill, and may not even be real ones.

Although we are in entire sympathy with Dr. Ray's aims we cannot help feeling that such a Bill—even if passed into law—may be difficult, or even impossible, to work, and may remain on the statute book as a dead measure. Sanitary legislation cannot go ahead, or at any rate far ahead, of public opinion. In India the sanitary conscience is not yet developed to any high degree; there is the dead-weight of centuries of inertia and the stifling influence of certain caste and racial customs to be overcome. The remedy for this state of affairs is not merely legislation from above—you cannot make the village rayat of India sanitary by force of law—but education from below. That remedy has not been neglected, but only the merest surface of the problem has as yet been scratched. Health weeks, baby and health welfare clinics, the model demonstration trains on the Indian railways with their instructional cinema films and health posters—these and similar measures may help to arouse a sanitary conscience in this land. There are the laws of Manu. May it not be possible by incessant teaching and propaganda to supplement them by the laws of personal cleanliness and the observation of the rudiments of hygiene? We would like to see elementary instruction in hygiene—made as attractive as possible by coloured posters, cinema films if possible, and well got up pamphlets—a part of the course of instruction in every elementary and secondary school in India. Indeed, we are far from certain that such instruction is not also wanted for university students in India. It has been well said that Medicine is a legacy of priestcraft, witchcraft, and leechcraft; but present day Preventive Medicine has long ago thrown off those shackles. To-day it is inspired

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

by the ideal of a public and communal sanitary conscience; and there are not a few factors in the ancient Brahminical and Moslem religions of India which might be utilised in promoting the growth of such a conscience.

Nevertheless we welcome Dr. Ray's Bill. In the Legislative Council a discussion on it alone would justify its introduction, whilst its passage into law would, one hopes, make more possible the collection of accurate data relating to infectious diseases in the Province, encourage a more correct appreciation of the problems that exist, and, possibly, indicate some of the measures necessary to combat them.

It must not, however, be imagined that the passing of such an Act will *per se* achieve anything, nor must legislators allow its passage to lull their consciences. It can only achieve any good result if it is associated with an extensive scheme of steady public health propaganda. Many avenues of contact with the people remain to be explored; there is to-day far too large a gap between the results of medical research in this country and their practical application in the Indian field. Indeed this appears to us to be the immediate problem of the future. We know how to prevent most of the common diseases of India; how can we make that knowledge common property to the citizens of this land? We fear that superimposed legislation alone is no solution to this problem.

CHEMOTHERAPY.

CHEMOTHERAPY is a word that has come very prominently into use in medical literature during the last two decades. The medical dictionaries say that the word means "the use of chemical substances in therapeutics." Magnesium sulphate is a chemical substance, but chemotherapy would be a somewhat grandiose word to apply to the humble act of taking one's morning dose of salts. The word has acquired a much more specific meaning than this. Many persons use it to mean treatment by means of complex synthetic chemical compounds, as opposed to treatment by means of medicinal plant extracts and other substances which occur in nature. This, according to Professor Bernardt Nocht, is not the true meaning of the word; he considers that the word implies treatment directed against the causative organism of the disease rather than against the symptoms which are the reaction of the human body towards the organism. This latter is probably a better definition as it reflects more truly the ideals of Ehrlich, the father—rather than the inventor—of chemotherapy. This definition allows the inclusion of such drugs as quinine and the cinchona alkaloids, as they are used mainly for their action against the specific organism and not as febrifuges, but it excludes synthetic compounds, such as aspirin, which is used almost exclusively for its analgesic, antipyretic and chologogic properties.

To the average practitioner working in Europe and North America, chemotherapy means only one thing, that is salvarsan and the allied arsenicals, but to the worker in the tropical zones it has opened up a much wider field of vision. Even the synthetic arsenicals themselves have a wider applicability as they are not only specifics for syphilis, a disease which has a very high incidence in most tropical countries, but also for other spirillar (spirochætal) diseases such as yaws, relapsing fever and rat-bite fever. In the treatment of all protozoal diseases chemotherapy plays an all-important part. The drugs employed aim at the destruction of the causative parasite, and in nearly every instance these drugs are synthetic ones; the principal exception to this generalisation is quinine, and the allied alkaloids. Malaria is outstandingly the most important disease in tropical medicine and until quite recently we have been dependent for its treatment on the cinchona alkaloids; these are not synthetic drugs although they are administered with the object of destroying the plasmodium, the causative organism of the disease. Now, however, another drug has come into use; this drug is a synthetic compound and therefore a true child of chemotherapy. It is true that extravagant claims have been made for Plasmochin, but there now appears to be little doubt that in the treatment of benign tertian malaria it is very definitely superior to quinine. At present the cost of this compound stands in the way of its universal substitution for the cinchona alkaloids, but further research into the methods of preparation will probably make it possible for the manufacturers to place it on the market at a price comparable to that of quinine. Besides the comparatively high price of this compound it has other very distinct drawbacks; certain very definite toxic symptoms have been reported following its administration so that it has to be given cautiously and under very strict medical supervision, and it has no action whatsoever on the asexual forms of the parasites of malignant tertian malaria. As has been pointed out many times, the discovery of Plasmochin must be looked upon not as the final but as the first successful step in the attempt to prepare a synthetic compound for the eradication of malaria. One cannot for a moment suppose that this was the first compound that the inventors stumbled upon which had any effect on the plasmodium and we must admire their self-control in waiting until they had discovered one which had definite advantages over quinine. We hope that they will now go further and produce some compound which not only has a destructive action on the asexual forms of *Plasmodium falciparum*, but also lacks the toxic action of Plasmochin.

Probably chemotherapy's most dramatic triumph has been in the treatment of kala-azar.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In syphilis and many of the other diseases referred to above various other remedies are available and have been employed with considerable success for a number of years, but until intravenous antimony tartrate was used in the treatment of kala-azar the disease was for all practical considerations a fatal one. Now a cure can be produced in at least 95 per cent. of patients by a course of injections which can be completed in as short a time as a week in many instances, and by the use of a drug the cost of which is by no means prohibitive. In this connection we deliberately used the word kala-azar and not leishmaniasis, because although success has been claimed for the treatment of other forms of leishmaniasis with the various antimony compounds the results of treatment have not been so dramatic as in the case of kala-azar; in the treatment of oriental sore, in particular, other means of treatment are still employed and claimed by some as superior.

Except in the treatment of syphilis, chemotherapy is employed very little in the treatment of diseases of the temperate zones. Gold compounds have been used in the treatment of tuberculosis but with no very startling success; the lead treatment of cancer has apparently been successful in some hands, but it has not been hailed by the majority of workers as a great advance in the treatment of this deadly disease. When one remembers what profound changes can be produced in the human body by the introduction of a few doses of some synthetic compounds, for example by the injection of certain of the pentavalent antimony compounds, one wonders whether it will not be chemotherapy which will come to the rescue of the human race in their fight against the two most serious universal diseases, cancer and tuberculosis.

Medical News.

THE INDIAN SCIENCE CONGRESS, 1930.

THE Indian Science Congress, 1930, is to be held at Allahabad in the first week of January, 1930. The President of the Medical and Veterinary Research Section is Lieut.-Col. R. Knowles, I.M.S.

In view of the fact that an excessive number of papers have been received in past years which has made it impossible for all the papers to be read in the time available, and necessitated the curtailment of discussion on other papers, it is unfortunately necessary to exercise a strict selection. Authors are therefore requested to take note of the following points:

(*i*) Papers *must* be received by the Sectional President (Lieut.-Col. R. Knowles, I.M.S., Calcutta School of Tropical Medicine) not later than the 5th October, 1929. *Papers received at a later date simply cannot be accepted.*

(*ii*) Only original papers, that is to say papers which have not already been read or published in the same or similar form, will be accepted. Not more than two papers will be accepted from any one contributor.

(*iii*) Papers will not be accepted from individuals who have not paid their subscription. (The General Secretary has asked us to particularly bring this matter to the notice of our readers.)

(*iv*) Papers must be sufficiently short to be read in 20 minutes. It takes 3 minutes to read a page of foolscap intelligibly, apart from diagrams, slides, etc. (Papers should not, therefore, exceed 7 pages of typed foolscap.

(*v*) Papers *must* be accompanied by 3 typed copies of an abstract of the paper. This abstract must not exceed 200 words, and should not contain any formulæ or diagrams. *Papers not accompanied by such abstracts will not be accepted.* (It is not fair on members of the Congress not to have due notice from the programme of what the paper is about.)

(*vi*) All diagrams, tables, pictures, etc., should be reduced to lantern slides, or enlarged to posters corresponding in type to 6|18 Snellen.

(*vii*) Authors should not contribute accounts of their papers to the local lay press. (It is hoped that it will be possible to arrange for a daily precis of the proceedings in the Medical and Veterinary Section to be sent to the press officially by the President of the Section.)

Will our readers kindly take this notification as the first official intimation with regard to the 1930 Congress? We trust, further, that the members of the medical and veterinary professions in Allahabad will co-operate to make the 1930 Congress a successful one.

There are three classes of members of the Indian Science Congress; viz:—

(*i*) Full members; annual subscription, Rs 10.

(*ii*) Associate members; annual subscription, Rs 5.

(*iii*) Student members (who must be certified by the principal of their college to be such), Rs 2.

Only full members have the right to read papers. Associate and student members may submit papers through a full member. Subscriptions should be paid to the Hony. Treasurer, Indian Science Congress, c/o the Asiatic Society of Bengal, 1, Park Street, Calcutta.

THE FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE.

WE are asked to announce that the Eighth Congress of the Far Eastern Association of Tropical Medicine will be held in Bangkok in December, 1930. Any of our readers who are anxious to attend this Congress should communicate with Lieut.-Col. A. D. Stewart, I.M.S.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Calcutta School of Tropical Medicine and Hygiene, Central Avenue, Calcutta, at an early date.

The *Transactions* of the Seventh Congress of the Association, held in Calcutta in December, 1927, are in an advanced state of preparation, and it is hoped that they will be published at an early date. The first volume has just been received for review.

THE INDIAN HONOURS LIST. 1st March, 1929.

THE following are the names of medical persons in the Indian Honours List of date the 1st March, 1929. We would offer them our congratulations.

C. I. E.

Lieut.-Col. C. I. Brierly, Chief Medical Officer, North-West Frontier Province.

Lieut.-Col. R. E. Wright, Superintendent, Government Ophthalmic Hospital, Madras.

Lieut.-Col. H. H. Broome, Principal, King Edward Memorial College, Lahore.

Mr. H. T. Holland, Medical Missionary, Baluchistan.

C. B. E.

Lieut.-Col. J. K. S. Fleming, Deputy Director-General, Indian Medical Service.

Knighthood.

Khan Bahadur N. H. Choksey, Medical Practitioner, Bombay.

Kaisar-i-Hind Medal (First Class).

Mr. Davys, Assistant in the Military Food Laboratory, Kasauli.

Mrs. Chute, Canadian Baptist Mission Hospital, Akidu, West Godavari District.

Rev. E. H. Sharpe, Superintendent, Purulia Leper Asylum, Bihar.

Mr. N. M. E. Banorawala, Principal Medical Officer, Bikaner State.

Kaisar-i-Hind (Second Class).

Mrs. Simpson, Red-Cross, Bengal.

Mrs. Siddons, Private Medical Practitioner, Central India.

Dr. Gama, Superintendent, Lady Dufferin Hospital, Patiala.

Rai Bahadur.

Mr. Haralal Singh, First Assistant Chemical Examiner, Government of Bengal.

Thakur Sheo Baran Singh, Officiating Civil Surgeon, United Provinces.

Khan Sahib.

Subedar Maula Bakksh, Senior Sub-asst. Surgeon, Punjab.

Rai Sahib.

Mr. Manni Lal Shukla, Medical Officer, Jail and Police Hospitals, Cawnpore.

Mr. Upendranath Roy Choudhuri, Jailor, Central Jail, Gaya.

Mr. Nripendranath Gupta, Medical Practitioner, Muzafferpur.

Mr. Jotindra Kumar Sen, Second Medical Officer, Sadar Hospital, Purnea.

FOURTH IMPERIAL SOCIAL HYGIENE CONGRESS, 1929.

DELEGATES from all parts of the Empire representative of the Dominion, Indian and Colonial Governments as well as health and education authorities, universities and social organisations, will assemble in London for this year's Imperial Social Hygiene Congress.

The Conference, the fourth of its kind, is being arranged by the British Social Hygiene Council, of which the Marquess of Linlithgow is President with the support of Mr. L. S. Amery, M.P. (Secretary of State for Dominion and Colonial Affairs), Viscount Peel G.B.E. (Secretary of State for India), and Mr. Neville Chamberlain, M.P. (Minister of Health).

The proceedings will extend from July 8th to July 12th, and wide importance is likely to attach to the discussions.

Ten sessions will be held in all, and the programme includes a review of the whole international situation with regard to sex diseases. Papers will be submitted by well-known authorities on practically every phase of the social hygiene problem. One subject to which particular attention will be given is the development of the campaign for the prevention and cure of disease by education and enlightenment, and much interest will also centre in the debate which will take place relative to the effect of infection on industrial efficiency.

The Congress will also consider, among many other questions, the best means of organising and administering treatment centres, methods of propaganda in different communities, the relation between sex disease services and other public health services, such as those concerned with maternity and child-welfare, and methods of securing the co-operation of parents and teachers so that the rising generation may be taught a sense of responsibility in regard to sex conduct.

Those who are likely to be in London next July, and who are desirous of attending the Congress should write for information to the Secretary, British Social Hygiene Council, Carteret House, Carteret Street, London. S. W. 1.

CAMBRIDGE UNIVERSITY DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

WE have received from the University of Cambridge a copy of the regulations for the University Diploma in Medical Radiology and Electrology, and hope that the existence of this Diploma will become widely known to our readers. A considerable number of men in the Indian Medical Service have taken the Diploma in the past, and the Committee are desirous that the facilities offered at Cambridge for the study of medical radiology should be more widely known. The following is an abstract of the regulations:

General Regulations.

(1) Candidates for any examination leading up to a Medical Diploma are required to send their names to the Registrary of the University, together with the necessary certificates, not less than three weeks before

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the beginning of that examination and to pay at the same time the fee prescribed for admission or re-admission to it.

(2) An examination in each of the Medical Diplomas shall be held once, or if the Special Board for Medicine shall think it expedient, twice a year.

(3) The examiners shall publish a list of the names of successful candidates in each part of the examination in alphabetical order, but are empowered to place a mark of distinction against the name of any candidate who, in their opinion, has shown special proficiency either in Part I or in Part II of the examination.

Special Regulations for the Diploma in Medical Radiology and Electrology.

(1) Every candidate shall be required to pass an examination and to submit for the approval of the Committee a thesis composed by himself.

(2) The Examination shall be in two parts. In Part I the subjects shall be (*a*) Physics and (*b*) Electro-technics; in Part II (*a*) Radiology and (*b*) Electrology.

(3) Before admission to Part I a candidate shall produce evidence that he holds a medical qualification approved by the Committee and shall submit certificates showing that since obtaining that qualification he has diligently attended during three months, (*a*) a course of lectures and practical instruction both in Physics and Electro-technics, and (*b*) an introductory course of clinical instruction in Medical Radiology and Electrology.

(4) Before admission to Part II a candidate shall produce certificates showing (*a*) that since completing the requirements for admission to Part I he has for three months both received clinical instruction and attended clinical practice in the radiological department of a hospital, with not less than 200 beds, approved by the Committee, (*b*) that he has studied Medical Radiology and Electrology for not less than six months in all, and (*c*) that he has held his medical qualification for not less than a year.

(5) The thesis, to be submitted by a candidate after passing Parts I and II, shall be in the form of a critical report with notes upon six cases either in Radiology or Electrology or in both these subjects and shall illustrate various methods of diagnosis or treatment. The thesis shall be sent to the Registrary together with certificates; (*a*) that the candidate has, since passing the examination for the diploma, held for three months a clinical clerkship or similar appointment in a radiological department approved by the Committee, and (*b*) that the cases described by the candidate in his thesis have been examined and studied by him under the supervision of the person signing the certificate.

(6) In exceptional circumstances, a candidate who before admission to Part II produces satisfactory evidence that he has for at least three months held a responsible post as a radiologist approved by the Committee previously to the six months' study of Radiology and Electrology prescribed as a qualification for admission to Part II, may be exempted by the Committee from the requirement of 5 (*a*), and if so exempted shall be required to submit a thesis composed by himself on a subject previously approved by the Committee instead of the thesis prescribed in 5 (*b*).

(7) Each thesis shall be examined by two of the Examiners for Part II, who shall have power to require the candidate to present himself for an oral examination if they think fit to do so.

(8) All certificates of attendance at courses of instruction and clinical practice shall be signed by a person whose signature for that purpose has been approved by the Committee.

(9) Candidates before admission to either part of the examination shall be required to pay a fee of ten guineas and to pay a further fee of four guineas on submitting their thesis.

(10) The short title of the Diploma in Medical Radiology and Electrology shall be D. R. M. and E. (Camb.).

Course of Study for the Diploma.

The Course of Study for the Diploma extends over a period of not less than nine months.

The Course of Study embraces (1) a Lecture Course with practical work; (2) Clinical Instruction.

The Lecture Course:—

Part I.—(*a*) Physics; (*b*) Electro-technics.

Part II.—Radiology and Electrology.

Syllabus of Subjects.

PART I.

(*a*) PHYSICS.

Electrostatics. Electric Currents. Electromagnetic Induction. Radiation. X-rays. Radio-activity. Secondary rays excited by alpha, beta and gamma rays. Transformation of Radio-active substances.

(*b*) ELECTRO-TECHNICS.

Production of currents, direct and alternating. Sources of supply. Construction and action of motors and dynamos. Photography.

A knowledge of Physics equivalent to the first medical examination is expected on the part of candidates entering for the above course, and they are recommended to obtain supplementary instruction by attending a course in elementary physics.

PART II.

(*a*) RADIOLOGY.

General anatomy and Histology with special reference to Radiology. Morbid Anatomy with special reference to Radiology. Radio-diagnosis. Apparatus used in Radiography and Radio-therapy. X-ray Therapy. Radium Therapy. Forms of light and heat Treatment.

(*b*) ELECTROLOGY.

Electro-diagnosis. Electro-therapy.

Courses for the Diploma in Medical Radiology and Electrology.

Courses for Part I will be given simultaneously in Cambridge and London from October to December as follows:

CAMBRIDGE.

(*a*) Lectures and Practical work in Physics at the *Cavendish Laboratory* by G. Stead, M.A., University Lecturer in Physics as applied to Medical Radiology.

(*b*) Introductory course in Medical Radiology and Electrology in the *Radiological Department, Medical Schools,* by A. E. Barclay, O.B.E., M.A., M.D., D.M.R.E., University Lecturer in Medical Radiology and Electrology, and H. M. Meyrick Jones, M.D., B.S. (Durham), M.R.C.S., L.R.C.P.

LONDON.

(*a*) Lectures and Practical work in Physics at the *Middlesex Hospital* by Professor Sidney Russ, D.Sc. and at *King's College* by B. L. Worsnop, B.Sc. (These two courses are alternative.)

(*b*) Introductory course in Medical Radiology and Electrology at the *British Institute of Radiology* by J. Muir, O.B.E., B.Sc., M.B., Ch.B., and E. P. Cumberbatch, M.A., M.B., B.Ch.

The courses in Cambridge are open to non-members of the University, subject to the condition that their names are enrolled for the purpose at the Registry of the University and that they pay a fee of one-and-a-half guineas in respect of each quarter during which or any portion of which their names are so enrolled (*Ordinances*, 1927, pp. 69, 70).

Courses of lectures and clinical instruction for Part II will be given in London from January to March by lecturers appointed by the Educational Committee of the British Institute of Radiology.

Applications for information respecting the courses in Cambridge should be addressed to G. Stead, M.A., at the Cavendish Laboratory, Cambridge.

Applications for information respecting the courses in London should be addressed to the Director, British Institute of Radiology, 32, Welbeck Street, London, W. 1.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The following hospitals in London are recognised by the University of Cambridge for clinical instruction in the Radiological and Electrical Department: St. Bartholomew's; St. Thomas'; Charing Cross; St. George's; St. Mary's; Guy's; King's College; London; Middlesex; University College; Westminster; Royal Free; Cancer Hospital; Brompton (Chest); Queen Alexandra Military Hospital, and Royal Army Medical College; Prince of Wales' Hospital, N.E.; West London Post-Graduate College.

Examinations will be held at Cambridge as follows:
Part I—January and April.
Part II—April and July.

Fees.

	£	s.	d.
Composition fee covering lectures and practical work for Parts I and II, and three months' clinical instruction in the radiological department of a recognised hospital	47	5	0
Fee for Part I of the Examination ..	10	10	0
Fee for Part II of the Examination ..	10	10	0
Fee on presentation of a thesis ..	4	4	0

"ALL-INDIA MEDICAL CONGRESS," 1928-29.

RESOLUTIONS TO BE MOVED IN THE BENGAL LEGISLATIVE COUNCIL.

1. MR. Kiran Sankar Ray, Mr. Nalini Ranjan Sarkar, Mr. Amarendra Nath Ghose and Dr. Kumud Sankar Ray.—"This Council recommends to the Government that the constitution of the Governing Body of the State Medical Faculty of Bengal be formed as follows:—

(*a*) One representative to be elected by the Senate of the Calcutta University;

(*b*) One representative from each of the medical institutions affiliated to the Calcutta University or any other University in Bengal;

(*c*) One member to be nominated by the Local Government.

(*d*) Three non-official members to be nominated by the Bengal Council of Medical Registration from registered practitioners of not less than 10 years' standing, of which not more than one is to be nominated from amongst themselves.

(*e*) Three members to be elected from the teaching staff (including Professors, Asst. Professors, Lecturers, Demonstrators and Clinical Lecturers) by rotation from each non-official institution recognised by the Council of Medical Registration as eligible to train and send up students for their Licentiateship or Membership Examination of the State Medical Faculty of Bengal.

(*f*) Three members to be elected from the teaching staff (including Professors, Asst. Professors, Lecturers, Demonstrators and Clinical Lecturers) by rotation from each of the Government institutions recognised by the Council of Medical Registration as eligible to train and send up students for the Licentiateship or Membership Examination of the State Medical Faculty of Bengal.

(*g*) Three members to be elected by the registered practitioners of 10 years' standing—

(*i*) one from the British qualified practitioners of 10 years' standing;

(*ii*) one from the M.B.'s and L.M.S.'s of the Calcutta University of 10 years' standing;

(*iii*) one from the L.M.F.'s of the State Medical Faculty of Bengal of 10 years' standing; and

(*h*) The President is to be elected by the governing body from amongst their own members."

2. Mr. Surendra Nath Biswas.—"This Council recommends to the Government to provide in the next budget a capital grant of Rs. 1,00,000 to the Calcutta Medical Aid and Research Society for the construction of a Phthisis Ward."

3. Mr. J. Campbell Forester and Mr. H. S. Suhrawardy.—"This Council recommends to the Government that Rs. 5,00,000 spread over two years be allotted to the Jatiya Ayurbijnan Parishad (half in the next budget and the other in the succeeding budget) in the form of a capital grant for removing its school (National Medical Institute) from Maniktola to Entally and converting the whole premises at Maniktola into a Beggars Hospital."

4. Mr. Surendra Nath Biswas.—"This Council recommends to the Government to provide in the next budget a capital grant of Rs. 4,00,000 to the Jatiya Ayurbijnan Parishad for acquiring land and construction of school buildings for The National Medical Institute and development of the National Infirmary."

5. Mr. Kiran Sankar Ray, Mr. Amarendra Nath Ghosh and Mr. Nalini Ranjan Sirkar.—"This Council recommends to the Government to remove the special exemption enjoyed by the Government Medical Schools from being required to be recognised by the Council of Medical Registration, Bengal, in the first instance before permitting their students to sit for examinations conducted by the State Medical Faculty of Bengal as is required in case of non-official medical institutions."

INFAMOUS CONDUCT.

ONE of the subjects discussed by the Conference (All-India Medical Congress) was the question of medical ethics. A resolution was passed on the question of "infamous conduct" in discharge of professional duties. The Conference unanimously resolved that the ethical rules applicable to England were not suitable for India and that the executive committee of the All-India Medical Association, which is to be formed, should be requested to draw up a code of medical ethics and submit the same to the next annual conference.

SPECIAL ARTICLES.

OPHTHALMOLOGY IN RELATION TO RESEARCH.*

(*Being the presidential address to the Medical and Veterinary Research Section of the Sixteenth Indian Science Congress, held at Madras in January, 1929.*)

By R. E. WRIGHT, M.D.,
LIEUTENANT-COLONEL, I.M.S.,
President of the Section, and Superintendent, Government Ophthalmic Hospital, Madras.

LADIES AND GENTLEMEN,

As you are probably aware, I have been appointed at the eleventh hour to fill the place of Lt.-Col. R. Knowles, originally elected as President of the Section. I can only regret—with you—that he is not here to-day to do justice to the chair I occupy. This section heretofore has been almost confined to the consideration of research of one type or another and it is but fitting that a research worker should preside over it. It may, therefore, seem out of place that a clinician like myself should venture to address you although I had at one time the privilege of belonging

* Published by kind permission of the Secretary and Council of the Asiatic Society of Bengal.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to the Bacteriological Department, and have always tried to keep in touch with medical and veterinary research in this country. As my energies have been for a long time confined to work in the field of ophthalmology, it will not surprise you if my address deals chiefly with this subject in its relation to research.

RESEARCH ORGANISATION IN INDIA.

Whether in the field of medical or veterinary science, the members of this section and our colleagues throughout the world are all potentially or actually research workers; and although the term research is now most frequently used in a somewhat special and limited sense, which does not even convey the same meaning to all of us, it should not necessarily be so restricted. When I first came to India organised research was almost confined to a small body of workers who devoted their energies to investigations in connection with bacteriology, immunology, entomology, protozoology, and parasitology. The nuclei round which these activities for the most part developed, were the centres for the investigation and prevention of smallpox, plague, rabies, snake-bite, rinderpest and surra. Looking back now one might be inclined to consider that we brought very heavy weapons to bear on rabies and snake-bite, which are comparatively unimportant economically; but the machinery was such that the individuals employed found no suitable environment for launching forth into the investigation of the huge problems in connection with malaria, kala-azar, hookworm, cholera, water contamination, the dysenteries, the less understood fevers peculiar to India, and the many contagious diseases of animals. Before this organised research started there were, of course, many distinguished scientific workers carrying out isolated investigations of the utmost importance. The same is true to-day, because it is impracticable and undesirable that there should be universal direction and control. It is important, however, that our researches should have international connections so as to secure the corrective of universal criticism. In the very early days some magnificent pieces of individual work stand out. It would be invidious to mention names, as many of those who figured so prominently in the world of tropical research are still amongst us. Sir Pardey Lukis made a great effort to co-ordinate medical research in India as a whole, and gradually an organised department was established. This, at first, was somewhat watertight, but by degrees a liaison was established between the public health services on the one hand and the clinical services on the other. The Bombay Bacteriological Laboratory at Parel, now known as the Haffkine Institute, played a large part in uniting the pure laboratory worker with the clinician, and the founding of the Calcutta School crowned the movement and established direct contact in a most suitable environment. Our provincial public health services are linked up with each other, and with the international health problems through the Public Health Commissioner, who keeps the Office Internationale d'Hygiene Publique, and the League of Nations Health Department in touch with India, and who also is closely identified with health activities in the Far East, we still look forward to the establishment of a powerful school of hygiene. It is said that such a school is destined for Calcutta, let us hope that the day is not far off when it will materialise and rival in vitality the School of Tropical Medicine. We may, however, congratulate ourselves that in the last twenty years the different types of work and the workers have been brought into more intimate contact. Now the individual investigator, whether engaged in the hospital clinic, in public health or veterinary field work, or in the laboratory, is able to establish co-operation with others who are willing to place their special facilities or knowledge at his disposal in order to enhance his endeavours.

The medical, veterinary and agricultural departments have come nearer, and some, at all events, realise the vast importance of a still more intimate association in connection with food problems,—both human and animal,—and the public health. But this is not sufficient. Investigations into the causes of disease in man and animals is so intimately related that it is hard to conceive of a medical worker being in a position to prosecute his researches with any great profundity without a good general knowledge of what has happened and is happening in the veterinary field, and *vice versa*. There are some medical men, and not a few of the laity, to whom veterinary work appears to suggest little more than the treatment of sick cattle and dogs, or the granting of certificates for horses. A study of current veterinary literature would convince such persons of their lamentable ignorance. In bacteriological research particularly, the two sciences are so intimately bound up as to be inseparable. I have personally always enjoyed the fullest co-operation from my veterinary colleagues, and am indebted to them for much help and inspiration.

THE ULTIMATE OBJECT OF OUR RESEARCHES.

If then we regard the individuals of the Medical and Veterinary Departments as research workers in greater or lesser degree, what is the object of our combined efforts, what is the "big ideal?" Ultimately, it is the advancement of the welfare of mankind. Darwin says, "Man, like every other animal, has no doubt advanced to his present high condition through a struggle for existence consequent on his rapid multiplication; and if he is to advance still higher, it is to be feared that he must remain subject to a severe struggle. Otherwise he would sink into indolence and the more gifted man would not be more successful in the battle of life than the less gifted. Hence our natural rate of increase though leading to many and obvious evils, must not be greatly diminished by any means." Again he says, "Important as the struggle for existence has been and even still is, yet as far as the highest part of man's nature is concerned there are other agencies more important. For the moral qualities are advanced, either directly or indirectly, much more through the efforts of habit, the reasoning powers, instruction, religion, etc., than through natural selection; though to this agency may be safely attributed the social instincts, which afforded the basis for the development of the moral sense."

"The high standard of our intellectual powers and moral disposition is the greatest difficulty which presents itself, after we have been driven to this conclusion on the origin of man." Since then Elliot Smith and others have shown us that man's intellectual supremacy is due to the expansion of the brain in connection with vision. "Smell was the foundation upon which the neopallium was begun, and upon the distance-receptor vision it attained its highest perfection in man." (Parsons). Elliot Smith says, "One could say with considerable confidence that the essential fact which brought about the emergence of man's distinctive qualities of mind depended, in the last resort, on the cultivation of the enhanced powers of conjugate movements of the eyes"; and again, "The acquisition of a macula was dependent on these powers of conjugate movement." Keith (1925) remarks, "One of the greatest services rendered to anatomy by Prof. Elliot Smith was the clear proof he gave, fifteen years ago, that the evolution of bifoveate vision was the result of sight ousting smell as the dominant sense."....."It was clear that the superiority of man's vision lay, not in the kind of eye with which he had been provided, but in the brain which had grown up behind his eyes." This state of brain evolution,—which, phylogenetically under the influence of natural selection was determined by increased reliance on vision acquired by the lemurs, and, making its appearance at an early stage, (Eocene), determined the branching off of the true primates,—differs only in the higher and lower types of existing man, in those intellectual, social, and moral qualities above mentioned. These have appeared, not in the course of natural selection, but in the modified or controlled state of social

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

existence which man has adopted as the result of the acquisition of knowledge and reasoning. The elaboration of man's brain in his controlled evolution is to our research activities like the climbing of a mountain. As each higher level of intelligence is attained, so we are enabled to perceive and understand the activities at a lower level, which is impossible to those below. At every step the climber is only partially aware of what is happening in his own contour; if he would appreciate fully what is happening at this level he must get higher. So our intelligence strives in vague theorising after the view obtainable from the summit, not quite so blindly after the point just above us, which, after a time we make good, by the aid of a foothold here, or a handhold there, such as a new hypothesis in physics or discovery in chemistry. But the climber must have an appreciation of higher things, and aspire to reach them, not losing perspective and wandering aimlessly in his own contour, without recognising valuable aids, nor giving, nor receiving, help which would lead him upwards. During this period of controlled evolution, medical and veterinary sciences, (with the sciences on which they depend, and to which they are related), exercised a most important influence, but vision continued to play the prominent part in the evolution of man's brain. From the simple relief of human suffering and preservation of the individual life at one end of the horizon, to the higher flights of sociological endeavours,—into which our particular sciences imperceptibly merge,—and the national, and international machinery for the eventual improvement of man's lot, at the other, there is a caravan of individual and collective effort. It is impossible to foresee what the effect of all this control will be on the nation or on the race. Our veterinarians have been well aware for many years of the possibilities of improving stock by selection. This is not such a simple procedure as it might appear for many reasons, amongst others the interference with fertility under more highly domesticated conditions of life. Man, however, in his own case, far from synchronising with natural laws such as those which determined his appearance, has evolved those practices, arts and sciences, which heal the cripple, foster the undesirable, make the conditions for the transmission of hereditary diseases more favourable, and handicap the progress of the more highly developed mental and physical types. All life is preserved,—good lives and bad,—and all agencies which are destructive to life are attacked; in spite of the fact that under natural conditions multiplication tends to outrun the food supply, and that there is only room for a limited number. Are we fostering a deterioration? Is it all a mistake? How does one reconcile the preservation of *all* human life, the suppression of disease, the control of birth, and the elimination of war with the ultimate production of the best human machines? There are signs of disquietude, national and racial. We have periodic endeavours to eliminate undesirables. One European State has approved of the sterilisation of certain of the unfit, and the propagation of the mentally defective is limited, and may soon be controlled. America, awakened to the fact that her desirable racial types were being crowded out by the undesirables, introduced the quota. The position was even worse than that of Glasgow, where, apart from the undesirability of the actual invasion, the immigration of an Irishman, as Dr. Crew points out, may of itself prevent the birth of a Scotsman. It is admitted that the best racial types tend to commit race suicide. It may even be that those who apply the details of medical, veterinary and general research to the formulation of sociological laws, and otherwise tamper with the problem of population and genetics, may make such mistakes as to obliterate completely the highest products of man's evolution.

With such ideas in one's mind, it is somewhat comforting to turn to Sir G. Newman's reports for England and Wales, and realise that during the last forty odd years in a community moderately disciplined, and partially educated in matters of hygiene, the disease rate has diminished, the average duration of life has been prolonged, conditions of living have improved, the birth rate has fallen, and infant mortality has decreased, although the population during these years has outgrown the indigenous food supply. Instinctively we take it for granted, that, in the kaleidoscopic vista of controlled evolution, the part we are playing in the elimination of disease and suffering, and the betterment of the conditions of human life, must necessarily repercuss on the evolution of the brain, and eventually enable man to guide human destiny along an ascending plane.

The General Nature of our Activities.

As man's eventual welfare is ultimately dependent on the further development of his brain, this is the axis round which our activities in medical and veterinary science revolve. Let us consider some of the ways in which the various members of the medical and veterinary professions employ themselves. For the most part they can be grouped according to whether their activities are mainly concerned with curative medicine and clinical investigation, laboratory investigation, or hygiene and public health, all of which are interdependent. We need hardly concern ourselves with the unborn child, but the expectant mother figures prominently in the public eye, and the toxæmias of pregnancy, and the high maternal mortality rate, are causes of the greatest concern to the obstetrician today. The new-born child comes immediately into the purview of some of the most elemental and far-reaching investigations of modern medical and veterinary science, namely those in connection with foodstuffs and radiant energy. Here the medical and veterinary sciences go hand in hand and they must of necessity link up with the sister department of Agriculture. The economic importance of research in connection with nutrition, diet, and essential food factors in India is obvious, but it is only comparatively recently that it has developed a real scientific and practical side. McCarrison has done much to attract the agriculturists and veterinarians, and we hope for the greatest benefits from this line of research when co-operation is established between the various departments concerned.

As human beings develop and become liable to attack by the vast army of diseases, their conditions of life become the subject of attention from the three groups above mentioned, the clinician, who represents curative medicine, the exponent of hygiene and public health, representing preventive medicine, and the laboratory investigator, who, often too widely removed from his colleagues, pursues those more experimental and intensively detailed studies which are calculated to supply the key to the solution of the others' difficulties. Curative medicine cannot be divorced from clinical research, and although there are some who hold that curative medicine is a luxury of civilisation, still, the human machine will need repairs as long as humane motives prompt the healing art, and the dictates of the instinct of self-preservation hold sway.

Systematised clinical medicine is the backbone of our professional activities. One has only to think of the great recent advances in plastic and brain surgery, or of that in connection with the air passages and transplantation, to realise the value of careful clinical investigation and to appreciate that surgery is not yet up against a dead end. But even now, just as when the new era of surgery dawned, its best efforts are based on the findings of the laboratory. It is to organised clinical investigation, in co-operation with the practitioner on the one hand, and the laboratory worker on the other, that we must look for rapid advances. Some of the highly organised clinics in America such as the Mayo Clinic, the Johns Hopkins Hospital, and in Canada the McGill University, have been steadily turning out systematic co-ordinated research work for years. The comparatively recent introduction of whole time clinicians and hospital units in the English schools, shows that a need of co-operation in education and clinical research was felt. Unorganised clinical research

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

depends on the periodic appearance of giants in science. The recent investigation in connection with liver treatment in pernicious anæmia in the United Kingdom, shows how a number of different clinical centres all over the country can work in harmony with a directing head. In the investigations into chemotherapy, pharmacology and organotherapy we see some of the finest organised clinical work of recent years. The chemotherapist has practically filched one of the three great chronic granulomata from the surgeon, and launched a determined attack on the other two. On the other hand one of the greatest disgraces to our science is the way in which the inquiry into organotherapy has been allowed to drift into the hands of vendors who exploit the general public. These are encouraged by empiricists in the profession, who might do so much to help real research if a collective effort were organised. You are probably all inundated with pamphlets and circulars by mail from overseas, the bulk of which are got up to advertise organotherapeutic products. If the part of the contents which relates to ophthalmology is an index of that which appertains to other branches of medical science, the responsible firms ought to be penalised. One would like to see a tax on such advertisements, as a protection to the public and the profession.

It is in the laboratory that the ultimate cause of disease is tracked down, and accurate means of diagnosis elaborated. Here the pure research worker finds his natural habitat. Up to now, in India, he has for the most part engaged himself with the ultimate problems which face the clinician and public health worker, and has been the base of supply, as it were, for these two in their attack on disease. But as there must be research in all branches of medical and veterinary science, the efficient laboratory system must have representation in all the roots of our sciences. Ideal research laboratories should therefore give a home to those subdivisions of research which deal with clinical medicine and surgery, nutrition, pharmacology, organotherapy, hygiene, and so on, in addition to those commonly associated with such institutions. The part played by our sciences in public health has made enormous strides of recent years. The work of the public health department, has, in association with the Indian Research Fund Association, made itself felt in international medical science. One can get a good general idea of the nature of our activities by contemplating the scope of the Proceedings of the Far Eastern Association of Tropical Medicine and Hygiene. As Col. Megaw has written, it "is now regarded as the most valuable symposium of tropical medicine which has ever been held."

PERSPECTIVE AND CO-OPERATION.

The fact that curative medicine is readily marketable is often the undoing of members of the profession from the point of view of the individual pulling his weight in the combine. Provided, however, the clinician does not forget the first essentials of research, accurate observation, careful tabulation, and correct interpretation of facts and figures, he will always be the most important medical scientist to the man in the street, and essential to workers in the other, a little amused at the limitation of his brethren who are engaged in laboratory or public health work. The laboratory research worker who probes into isolated problems connected with the cause of disease, the man who, as he was described to me in the Rockefeller Institute last year, goes on finding out more and more about less and less, has perhaps some excuse for a limited horizon. His immediate effort is not so marketable as that of the clinician, and it is considered that to take his attention off his work, on account of such mere trifles as comparative affluence, is incompatible with research. The more rational view is that the research worker must not only be freed from the petty annoyance of making profit out of his work, but must also be put in such a position of well-being as to allow of his care-free attention. In the best organisations to-day this object is aimed at, but hardly yet achieved. It is probably true that if scientific research were properly organised and co-operation established,—not in medicine alone, but in the great basic sciences also,—it could wield a controlling power in the world's affairs. At present science as a whole is in the position of the medical laboratory research worker, exploited by those who pick its brains. We were reminded not long ago by His Excellency the Viceroy when speaking on scientific research, that according to one author, the true scientific method includes keeping no secrets, attempting no monopolies, serving no other end but knowledge. No doubt to strive after the highest ideals in life's work is an attribute of the more advanced evolution of man's mind, but one sometimes wonders whether the politicians and the promoters of industry, who are so insistent on the ideal where the scientist is concerned, might not be encouraged to apply the same philosophy in their own spheres, if science had more organised power. One looks back on the ill-feeling in connection with Ehrlich's great researches in chemotherapy and his careful release of 606, and cannot help contrasting it very favourably with the uncontrolled way in which investigators of the properties of ductless glands place immature work in the hands of the big vendors of the refuse of the stock yards.

Diseases vary in what is considered to be their economic importance, and in this connection the Public Health worker comes in contact with employers of labour and the local authority concerned with the good of the people, with politicians, and with nations. Public health has largely become an international affair, and in this we see the nearest approach to the working of medical science for the "big idea." We are all a little inclined to think that our own particular line of action is vastly important, and by contrast, there is a lack of appreciation of the work of others going on around us. For instance an intense ophthalmological research worker in India might easily lose sight of the fact that many of his activities would cease if the Agricultural Department reached a high functional level, or the local authority followed the lead of the more advanced European countries in the control and treatment of venereal diseases. In any case, it might be for him an unpleasant contemplation as whole time employment on refraction work is a very dull occupation. Fortunately there are in the ranks of medicine not a few natural philosophers who from time to time remind us of what are really working towards in our continued, even if partially blind, effort, and stimulate us to read just our perspective.

DIRECTION AND TRAINING.

The most important thing perhaps for the young research worker of to-day to remember is that the mere gathering together of a few facts and presenting them afresh, or the growing or failure to grow some in a test tube, does not constitute research. Amongst the greatest research workers are those who are able to assemble and evaluate recorded facts. The man with the spade may spend hours of toil on a subject which is valueless to himself or anybody else. Direction in research is all important unless the worker is sufficiently trained to choose important lines along which to work. Above all, the modern research worker must have a training which was denied to many of the older members of the medical and veterinary professions, in the essentials,—the bedrock subjects,—physics and chemistry. Most other subjects fade into insignificance as compared with these, and naturally, they go hand in hand with mathematics. An appreciation of the literature is vastly important. The greatest mistake many workers make is in not familiarising themselves with all the available work which was done before on the subject under consideration. Numbers of investigators waste months on a task which they might have avoided had they made a thorough preliminary survey of the literature. It is on deep foundations that the most important researches of the future must be built. The nature of the vital processes, the chemical, physical,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and electrical activities of the living cell, the interaction of the elements of vital tissues, the nature of energy and matter. These are the things of importance in the training of the younger generation. They must be able to use the more advanced teaching in those subjects as a means of interpreting and expressing their observations.

RESEARCH IN OPHTHALMOLOGY ILLUSTRATIVE OF, AND RELATED TO, RESEARCH IN GENERAL.

We have seen that the advancement of the welfare of mankind is our goal, and that this is ultimately dependant on the further development of his brain. Further we have seen that the brain of man reached its highest perfection through the agency of vision. It will not be inappropriate, therefore, if I give you an idea of some of the directions in which scientific investigation in connection with ophthalmology has progressed of recent years. In doing so I shall endeavour to exemplify by reference to this localised, but vastly important field, many of those types of activities with which we are all concerned, and reflect in the mirror of ophthalmological research, the various ways, in which medical and veterinary sciences in general, pursue the ultimate object of our endeavours.

The eye consists essentially of a globular outcrop of the brain which has become invaginated to form a cup, separated from the outside world by a transparent epithelium modified to form an optical system. The neural epithelium is capable of receiving distant stimulation by means of the radio-ceptors,—the rods and cones,—so that it is possible for us to form an impression of a source of radiation at an enormous distance, e.g., a star. We can examine this receptive organ during life by accurate methods which we cannot apply to any other part of the body. The ophthalmoscope enables us to obtain a magnified view, (about fifteen diameters), of the finer vessels on the surface of the retina, which, for all practical purposes is the surface of the brain, so that we can observe over long periods the changes taking place in this important system of vessels, from their earliest stages right up to the establishment of gross disease. We are thus enabled to gauge more accurately perhaps than by any other method applicable during life the probable changes which take place in the cerebral vessels. It is not only possible to undertake this histopathological investigation of living tissues, but our observations may be recorded accurately and scientifically by means of photography. The photography of the fundus oculi has now reached a practical stage and this method will be increasingly used in the future to record serial observations of pathological processes. One of the greatest advances in this field has been made by the introduction of slit-lamp illumination in connection with the corneal microscope. As Vögt has said, "with it ophthalmology has entered on a new stage of development." The improved instruments enable us to throw a sharply cut narrow beam of light into the eye, so as to produce an optical section of the cornea and lens, which may be examined with the binocular microscope at practical magnifications up to fifty diameters; (magnifications of over a hundred diameters may be obtained, but are impracticable for various reasons). The study of the eye by this means is known as biomicroscopy or the histology of the living eye. We are enabled thereby to study not only such minute details of cellular structure as the corneal endothelium, but the optical heterogeneity of tissues such as the lens and vitreous is disclosed, and their "relucency,"—as it is called,—is revealed, so that they exhibit a structure which was not hitherto detectable in dead fixed tissues under the microscope. The help which the method has afforded in connection with the investigation of certain conditions, formerly of a doubtful nature, has rendered it indispensable. We owe our advances in this direction chiefly to the researches of Vögt, Köeppe, and Henker. It has been particularly useful in connection with the study of lenticular changes of a cataractous nature.

The subject of cataract has, as you know, occupied a very prominent place in ophthalmological literature, particularly in the field of surgery. The surgical treatment of cataract, however, has probably had more than its share of prominence considering the relative economic importance of the subject, so I shall not do more than mention three of the factors, resulting from the clinical research in technique, which have sprung into prominence of late. They are, the elaboration by Barraquer of the suction pump for removing the lens in its capsule, the adoption of some means of retaining the lips of the section in apposition after operation, and the more extended use of novocaine in obtaining a painless and motionless field of operation. These factors have been prominently before the minds of workers in many of the large clinics of the world, and as may be seen from the literature Madras has not been behind hand. The method of blocking the main trunk of the seventh nerve near its exit from the skull, originally evolved here in the Government Ophthalmic Hospital, and now practised by us as a routine method, is coming into more general use. But research in this department of glorified carpentry is after all but temporising with the subject. As Duke-Elder, one of our ablest ophthalmological research workers of the younger school, has said, "When we as physicians fail to cure, and when we as surgeons lay down the test tube and take up the knife, we are, in so doing, merely confessing our failure as physicists, chemists, and admiting that, as yet, our laboratory is too complicated for us to understand, our reagents too complex for us to manipulate, and our knowledge too fragmentary and inadequate for us to apply it systematically." It is pleasing at all events to know that many prominent investigators are alive to this fact in connection with cataract, and we are now in a position to demonstrate the production of cataractous changes in the eye of the rabbit in a few minutes by isolated infra-red rays, and to observe the process with the corneal microscope. The most important recent work, however, which has been done in cataract is in connection with the chemical nature of lens protein. Lens protein is made up of several components, on the integrity of which its transparency depends. Under certain conditions a change takes place in one or more of these components rendering coagulation more liable to take place. There seems to be a strong school of thought, backed by an immense amount of experimental work in the realm of physico-chemistry, and radio-activity, which ascribes to the action of light on the constituents of lens protein, the first step,—the establishment of the predisposing factor as it were, in the production of cataract, other than complicated cataract. The equilibrium of the auto-oxidation system is interfered with and coagulative changes ensue. It is admitted on the other hand that typical instances of complicated cataract are due to alterations in the fluid available to the lens for its nutrition. The relative importance of these two processes appears to require much clarification. In so far as India is concerned it is probable that a very large number of cataracts labelled "senile" would more truly be styled complicated, and that alteration in the fluids which bathe the lens plays a leading rôle.

Most of you are no doubt familiar with Carrel's work on tissue culture. His original growths from heart muscle are still maintained in sub-culture. It is important for purposes of investigation in vitro to obtain a pure growth, and this is difficult, as it is desirable to use embryonic tissues. To remove the lens from a five-day old chick embryo is not easy, but it is possible. Dr. Kirby, a New York ophthalmologist working under Carrel's direction, has elaborated this technique and thus obtained an absolutely pure mass of actively growing epiblast for culture. The epithelium, which grows well on a sterile plasma surface in embryo juice, does not resemble lens epithelium, it is for example opaque. This fact is of immediate importance to the investigator. One wonders whether it is possible to grow clear lens epithelium. It may be that this line of investigation, in conjunction with

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the chemical investigation of lens protein, will yield valuable results.

An entirely different type of investigation is that in connection with the filterable viruses. For many years bacteriologists have been faced with a certain type of acute infective disease which is not associated with a demonstrable cause. One helpful fact emerged in connection with the group, namely, that the virus was filterable in certain cases, and that it is probably an ultra-microscopic living entity. In connection with certain of the so-called filter passers, observations have gradually crystallised into an hypothesis enunciated by Levaditi, that certain of them might be grouped as neurotropic ectodermoses. In this group some of the most informative work has been carried out on the herpetic affections of the eye. Here again we find the peculiar nature of the visual organ rendering material aid to a difficult research. The clinical processes in question are readily studied in the transparent cornea by the aid of the corneal microscope. You will, I trust, hear something of further interest on this subject when our research on the present extensive epidemic of superficial punctate keratitis is presented to the Section.

Investigations in connection with trachoma well illustrate how the cause of an important economic disease may ultimately be tracked down by a laboratory research worker. It had from ancient times given the clinician ample opportunity to demonstrate the futility of his curative methods, till, with the march of civilisation, it was taken out of his hands by the public health worker who dealt with it by segregation,—and that very effectively, as one may gather by the effect of the immigration laws put into force by the United States of America, and from a comparison between its spread in the Egyptian campaign early last century and its control in the late war. It may be too early yet to say definitely that Noguchi has discovered the causative organism of trachoma, and, even if he has, that it will afford a key to the control of the disease, but his work is a magnificent illustration of the adaptation of new methods of technique and procedure in connection with the isolation of a causative organism. Bacteriologists had sometime ago apparently arrived at an impasse; almost everything pathogenic to man that could be grown in a tube, with the limited media and methods available, had been grown. Noguchi, whose untimely death we have to deplore, was one of the pioneers in introducing new conceptions of cultural methods. Certain observers have failed to confirm his trachoma work, but it is doubtful if they have followed his technique. A few days before he sailed from New York for West Africa, Noguchi showed me his cultures of *B. granulosis* on semi-solid leptospira media, and demonstrated the disease produced by mass infection with pure cultures in his chimpanzees. His sections of the disease produced in monkeys were indistinguishable from sections of the human condition. His trachoma research has appeared as a supplement to the *Journal of Experimental Medicine*, and no doubt some of you have seen and admired this last fruit of his labours. Quite recently Prof. Axenfeld gave me to understand that Prof. Linder, who now holds the chair of Ophthalmology in Vienna and of whose bacteriological investigations you have possibly heard, was on his way to the Rockefeller Institute, New York; so the critical examination of Noguchi's work may be awaited in confidence.

The consideration of trachoma naturally leads one to think of the other great economic affections of the eyes. The commonest cause of blindness in England and Wales, according to the Departmental Committee on the Causes and Prevention of Blindness, is ophthalmia neonatorum. Not only is gonorrhœa of enormous importance, but so also is syphilis, competing with congenital defects for second place as a cause of blindness in infancy, accounting for a high percentage of the blindness of adults also. Venereal disease in various forms when looked at from the point of view of interference with human vision, on which our welfare so largely depends, assumes enormous relative importance. In certain countries maternity training and propaganda in connection with the prophylaxis of ophthalmia neonatorum has brought the attack rate to an apparently irreducible minimum which is still deplorably high. In England the Council of British Ophthalmologists, which exercises such an important influence on all matters touching the sight of the nation, has taken the further improvement of preventive measures in hand. The control of syphilis is progressing rapidly. The whole nature of the disease is ameliorating, and in this we have an example of a condition in which organised curative medicine in the mass, when founded on sure chemotherapy, may prove a better weapon than preventive medicine.

In India it is more difficult to evaluate the chief causes of preventable blindness. In the first place it is not possible to get accurate figures for the serious affections which attack the eye in the first month, year, or age period. Here we have an example of the importance of maintaining adequate returns for the compilation and application of vital statistics. It has been assumed that ophthalmia neonatorum is as important a cause of preventable blindness in India as in England. There are, however, some facts bearing on this assumption which must be considered. Ophthalmia neonatorum appears to be a milder affection in India,—at least amongst the inhabitants of Madras,—than it is in Europe; syphilis of the eye in the first year is not uncommon, and this, together with smallpox, keratomalacia, and the application of irritant remedies account for a relatively large amount of damage to the eyes in the first few years. It is probable that preventible blindness has been vastly reduced in this Presidency by better methods of vaccine production established by Cunningham, resulting in a higher protection rate, but reliable statistics are again necessary to confirm this view. This consideration helps us to appreciate in proper perspective the value of the laboratory worker, and the field worker, to an apparently isolated clinical section of the medical department. It might be a disquieting thought, that the King Institute of Preventive Medicine, Guindy, has perhaps done as much (or more) towards the prevention of blindness as the Government Ophthalmic Hospital, if we did not appreciate the work done by others and the fact that prevention is a more potent factor in the elimination of disease than cure.

Keratomalacia is a condition, the economic importance of which may have been heretofore underestimated, as it is not very uncommon in the early age periods and may mount up by summation of effects to a very important cause of the blindness at all ages in South India. As you know keratomalacia is a familiar affection in ophthalmic hospitals in India,—perhaps most so in Madras. At the last Congress here some of our work at the Government Ophthalmic Hospital on this subject was brought forward. Since that time enormous strides have been made in the realm of deficiency diseases, but we are very far from reducing them to concrete terms of physics and chemistry. In so far as clinical ophthalmology is concerned, we are in the same position now as five years ago. Cod-liver oil is the best all round method of treating keratomalacia. It is marvellous to watch an appalling condition of the eyes (and, of course, the respiratory and alimentary tract in the advanced condition), clear up under this treatment, and this alone.

The importance of combating the six affections due to smallpox, gonorrhœa, syphilis, irritant remedies, trachoma and keratomalacia, on account of their attack on the eyes in early life, is not realised in this country. Intensive propaganda work is urgently required. Money spent in this connection would be better spent than in establishing institutions for the blind, which although humane in intention, is beginning at the wrong end. The support of propaganda efforts has, up to now, been unenthusiastic.

Besides keratomalacia, there are other eye affections which are dependent on the proper relations of essential

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

food factors and the endocrine glands. We know that sunlight is the activating factor in the production of foodstuffs which are essential in maintaining normality. Both the cow and the grass must be irradiated if the milk is to have its full value. Indirectly we may have the eyes affected via this route, for example, in some of the juvenile cataracts. Von Szily, too, has demonstrated the production of cataract in suckling rats by withholding vitamin A from the mother, the so-called avitamine cataract.

The foregoing considerations lead us naturally to the subject of radiation in ophthalmology. The nature of light is at present in such a state of flux, and constitutes such a complicated problem, that we cannot here consider with advantage its full bearing on our investigations. We presume that life ultimately depends on light. Radiant energy to which the eye is transparent is harmless. It is rays which are absorbed which may damage the eye. These are notably the rays which merge with either end of the visible spectrum, the infra-red at the long end and the ultra-violet at the other. The radiant energy of wave lengths in between, i.e., white light,—which may be split up into its component parts as the visible spectrum,—is for the most part absorbed with the production of visual sensation. If in excess, part of it may be degraded into heat. The absorption of infra-red in greater amount than can be counteracted by the nature of the tissues, gives rise to a thermal lesion. We have seen above that such lesions may be demonstrated experimentally, e.g., cataractous changes in the lens. A concentration of infra-red rays at the macula, such as occurs, for example, during the ritual of sun gazing, or observing an eclipse of the sun without adequate protection, may produce an actual thermal lesion at the macula. The rays of short wave length,—the ultra-violet,—produce abiotic lesions, chiefly of the superficial parts. We do not yet know how far the investigations into the noxious influences associated with the absorption of heat waves and ultra-violet radiation may lead us. In India we are not very much concerned with the abiotic phenomena produced in the eye by ultra-violet radiation, although they are familiar enough at high altitudes. In the plains, however, it may be that the effects of the absorption of the infra-red radiations are of more far-reaching importance than we have any conception of. Duke-Elder has prosecuted the most interesting enquiry into the therapeutic action of ultra-violet light on certain diseases of the eye. The general action of controlled ultra-violet radiation appears to be associated with a raising of the bactericidal power of the blood. The eye diseases which respond best to general treatment appear to be tuberculosis and scrofulous conjunctivitis. For diseases of the cornea he uses a special mercury vapour lamp from which a beam may be thrown on the cornea in such a way as not to impinge on the lens. Various forms of blepharitis, conjunctivitis, and keratitis have been treated with good results. The value of irradiated ergosterol has not yet been established as of value.

One often hears it said that refraction is the "bread and butter" of ophthalmology. This may be so to limited extent, although the examination of the eyes in connection with optical defects, if done properly, is a time-absorbing process. As in many other varieties of medical relief, it is not always done properly. This is very largely determined by the attitude of the general public, and to a less extent by the ophthalmologist. It is not yet generally realised that the eventual well-being of the eyes is very largely bound up with this problem of accurate correction with spectacles, although Edward Jackson,—the doyen of American ophthalmology,—does not leave one in doubt on this point. Given eyes that have some visual acuity, it is essential to obtain the best optical results by means of artificial aids,—for by not doing so, latent disease may be fostered or a liability established. It is significant that,—as noted here by my predecessor Col. Kirkpatrick while observing cataract cases,—it is often in the eye with the greater error of refraction that a cataractous process first starts. The amount of work done on refraction in the last twenty years is enormous, although not more so than is commensurate with its importance, but except in the special literature it does not attract much attention. It is a difficult study involving basic principles, and research in this connection is not so "flashy" as in the less important operative fields, but fortunately there are those who realise the full value of correcting errors of refraction and muscle balance. In the English-speaking world, we owe a great deal in this respect to Duane and Jackson in America, Maddox and Percival in England, but the disabilities and loss of efficiency due to uncorrected errors of refraction are still not appreciated, even by the members of the profession.

The anatomy of the eye has attracted very considerable attention in recent years. Prof. Arthur Thompson of Oxford has been prominently identified with this movement. His association with ophthalmology was linked with that of Coats, a most distinguished investigator of clinical ophthalmology, who founded the Oxford Ophthalmological Congress. Prof. Thompson is responsible for the beautiful anatomical production, "The Anatomy of the Human eye as illustrated by enlarged Sterescopic Photographs," and Prof. Whitnall, formerly his Demonstrator, now Professor at McGill University, published a few years ago "The Anatomy of the Human Orbit and Accessory Organs of Vision." Some of you are possibly familiar with Onodi's work on the nasal accessory sinuses, and may perhaps have seen those of his dissections acquired for the Museum of the Royal College of Surgeons. Onodi's work on "The Optic Nerve and Accessory Sinuses of the Nose," was an important addition to our knowledge of the relation between diseases of the nose and of the eye, and, as an applied anatomical study, gave a clear idea of the relations of the nasal accessory sinuses to the orbit. The region of the basi-sphenoid is of the utmost importance to the eye specialist, because the optic nerves are intimately related to the great air cells and to the pituitary fossa, and subject to damage by pathological conditions of either. In connection with this part of the body, investigations by means of radiography have advanced enormously of recent years. The highest standard of radiographic work is essential in making diagnoses in this region, as for instance the demonstration of expansion of the optic foramina. You are probably all aware that in Madras we have the advantage of an excellent service in this respect.

Embroylogy is a subject which does not at first appear to offer a very fruitful field for ophthalmological research. Yet one has only to read Miss Mann's recent classical contribution to the literature to realise that her observations have thrown considerable light on some clinical problems, e.g., congenital defects. In addition she gives a clear conception of the ultimate nature of the structure of the eye, on which to found rational ideas of pathological processes.

A great deal of work had been published by continental writers but Miss Mann, as the result of her investigations on a unique series of human embryos, produced the first comprehensive account of the subject in the English language.

The research which has perhaps caused the greatest stir in ophthalmological circles is that of Duke-Elder on "The nature of the intraocular fluids" as related to glaucoma. With a more elaborate and delicate technique that has hitherto been considered practicable, he has measured the actual pressure in the retinal arteries and veins, and arrived at an idea as to the pressure variations in the capillaries. The hypothesis is put forward that the aqueous is a dialysate in equilibrium with the capillary blood, that there is no real circulation of the aqueous as previously understood, and that its escape by means of the filtration angle only takes place as an adjusting mechanism when the intra-ocular pressure rises above that in the canal of Schlemm. The vascular bed normally maintains a pressure at which an adequate circulation is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

maintained and thermo-dynamic equilibrium is established between the aqueous and the capillary plasma. Variations from this level may occur through, (*a*) altering the equilibrium level, either by a change in blood-pressure in the capillaries, a change in osmotic pressure between the aqueous and capillary plasma: or, (*b*) varying the volume pressure inside the eye, by alteration in dilation of the uveal vessels, varying the quantity of aqueous, or varying the volume of the vitreous or lens. Duke-Elder's work has enabled us to rearrange our ideas of glaucoma, and helped those whose working knowledge of chemistry and physics was insufficient adequately to express the phenomena which they had observed to form a clearer conception of the nature of this important affection. So far, however, the effect of these researches on treatment has not made itself felt except in one direction,—namely, that of rapidly reducing the intra-ocular tension by means of intravenous injections of hypertonic saline, so that we are still in the position of having to treat our cases by operation. As most of you are aware it is the operation which Elliot established here in Madras which is used by the majority of surgeons the world over to-day. It is not merely the operation of sclerocorneal trephining, however, but the careful clinical investigations which led up to its adoption, and studies in ophthalmology, especially those in tropical ophthalmology, which have established the reputation of my distinguished predecessor, and linked up the name of Madras with scientific ophthalmology wherever it is practised. The operative treatment of glaucoma is, however, but a temporary phase and a confession of ignorance. Work is gradually accumulating which may at no very remote date bring this appalling disease within the control of the physician. The main subject chosen for discussion at the International Congress of Ophthalmology this year is the non-operative treatment of glaucoma. Here in Madras we have a vast amount of material at hand, but in trying to utilise it we are driven back on that last line of defence—behind which many of our problems take refuge,—the obscurity of the physical and chemical processes involved. Some progress has been made both by the compilation of clinical observations and empirical treatment, and by more exact methods undertaken for us by the Professors of Chemistry and Biochemistry. One fact appears to stand out in connection with certain varieties of glaucoma,—as indeed with certain varieties of cataract,—and that is the association which exists between these diseases and involutionary change. This picture of involutionary change is constantly before the ophthalmologist in India, at least in the south. It is at present impossible to picture its essential pathological processes. It is suggestive that they resemble for example those of chronic anaphylaxis and that the alimentary tract is frequently abnormal. It is obvious that there are numerous milestones on the road which leads from the newly-born apparently healthy child to the grey haired, atrophic skinned, cataractous involute of thirty to forty. Many of them are obscure, but at least some are visible, namely, the consequences of excessive thermal radiation and inadequate food supply near the one end, and a damaged capillary endothelium near the other. There is invariably a summation of chemical and physical insults to the cells of the body as life goes on which finds expression in atrophy, degeneration and death. In South India the lack of energy supplies,—both enteral and extra-enteral,—together with the direct and indirect evils of infra-red radiation, are factors which operate conspicuously.

In the field of physiological research, vision has naturally always claimed a large share. One of the most profound and important directions in which much progress has been made of recent years is the relation between the eyes and the labyrinth, and the functions of the eye in connection with the postural reflexes. The decerebrate animal orientates itself in response to forces acting on it, such as gravity, by a reflex mechanism which depends for the most part on the labyrinth, whereby a movement of the head except horizontally is compensated for by a movement of the eyes. In the neck reflexes, the movements of the head in *any* direction are accompanied by compensating eye movements. If the cerebral hemispheres are removed, a resting animal orientates itself, and recovers its ordinary posture when aroused, by righting reflexes, acting through the mid-brain and labyrinth. In the monkey, provided the visual cortex remains, the righting reflexes are preserved even after labyrinthectomy. So that in higher animals the eyes can compensate for the loss of the labyrinths, the dominating influence of binocular vision coming into play.

As a final instance of research in connection with the eyes, we may consider the philosophical investigation of that most eminent ophthalmologist, Sir John Herbert Parsons. In his recent work, "An introduction to the theory of perception," we have a magnificent example of synthetic reasoning built up around the phenomena of vision. He hypothecates a biological basis for the phenomena of the higher visual and other perceptual processes, and advocates the development of psychology on a sound biological basis. He traces the genesis of perception from the lower levels phylogenetically where undifferentiated recepts give rise to responses vital to the preservation of the species. With further differentiation certain functions of the nervous mechanism assume a preponderant rôle, e.g., the olfactory apparatus in certain lower animals. The primates have attained their supremacy through the predominance of their visual function. From the human point of view perception appears to be the result of the correlation and integration of many and diverse sensory factors. Head propounded a dual mechanism for cutaneous sensation; a primitive protopathic and a more differentiated epicritic. Rivers applied the same idea to more complex integrations, instincts being essentially protopathic, whilst intelligent control of lower functions is epicritic. Parsons elaborates and modifies this line of reasoning. He hypothecates a dyscritic mechanism on which an epicritic is superimposed, and at a higher level still, "a syncritic mechanism subserved by the cortex cerebri, having the function of integrating epicritic phenomena." He says "Since perception is a phenomenon of consciousness, every inference must be derived from human experience: and since vision is the preponderant modality in the primates and has undergone the highest differentiation, it may be expected to afford especially valuable data. For that reason, and because it has been my own special study for many years, most of this thesis is devoted to that aspect of the subject.....for I am convinced that psychology, *as a science* can only be developed on a sound biological basis." Consciousness has developed in evolution because of its utility to the animal in sorting out, arranging, and utilising the messages which come in from the various receiving stations. To continue the simile, the man in the street cannot form a mental picture of what goes on in the head office with regard to decoding, retransmission, etc., but he may reasonably presume that it is similar in mechanism to what takes place at the receiving stations with which he is familiar. If he wants to appreciate fully what is happening in the various internal departments, he must not only have had experience in them, but have had the further experience of directing them. To be more technical, it is only by "back stroke" from a higher level of cortical experience that we are able to appreciate fully the nature of phenomena at lower levels. Sir John Parson's treatment of this subject illustrates, in so far as our research activities are concerned, integration at a syncritic level,—to use his own word,—and makes his reader feel the urgent need of accumulating experience of the basic facts of physics and chemistry, so as to utilise them by means of this mechanism in the elucidation of those phenomena which are incomprehensible without their aid.

And now having led you in thought to some of those higher pinnacles of our endeavours, let me conclude this discourse with an anticlimax. In so far as India

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is concerned, so long as the mind of the masses remains at such a low level of education in hygiene as it is to-day, we are only knocking our heads against a mud wall in trying to impose western curative and preventive medicine on a large scale. So long as the food supply remains limited, under present hygienic conditions, the population density will be adjusted to its food supply by catastrophic natural means, such as pestilence or famine, rather than by the more orderly proceeding of a fall in the birth rate. India is a magnificent field for medical and veterinary research, and all honest work done in this respect goes to pile up the credit balance placed at man's disposal for own ultimate good, but the results are for the most part inassimilable by the masses in India for want of education in hygiene.

WILLIAM HARVEY'S MESSAGE TO INDIA.

(Being an Address delivered to University College Medical Society, Rangoon, 1928).

By G. R. McROBERT, M.D., M.R.C.P.,

MAJOR, I.M.S.,

Professor of Physiology, Rangoon University.

THREE hundred years ago, in 1628, there appeared from a printing press in Frankfurt, Germany, a small book written in Latin by an English physician and destined to be hailed throughout the world in later years as the foundation of physiology and of all scientific medicine.

The book to which I refer was *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus, (An Anatomical Disquisition on the Motion of the Heart and Blood in Animals)* and its author was William Harvey, a fellow of and lecturer in the Royal College of Physicians, and a member of the medical staff of St. Bartholomew's Hospital in London.

So great and so well recognised has been the influence of Harvey's work on the subsequent development of biological science in general and of medical science in particular, that during the past few months tercentenary celebrations have been held on a magnificent scale by the leading scientific and academic bodies all over the civilized world, notably in England, France and America. In England, indeed, the celebrations arranged by the Royal College of Physicians with the co-operation of the universities of Oxford and of Cambridge were attended by distinguished representatives of nearly every country and state in the world, the delegates being received by His Majesty the King-Emperor, who laid emphasis in his address on the international character of science, which knows no boundaries of race or of nation.

The story of Harvey's life has been related many times of late and even the lay newspapers have devoted considerable space to biographical details. It is unnecessary therefore for me to do more than give a brief outline of Harvey's life.

Born at Folkestone, Kent, in 1578, Harvey received his earlier education at Canterbury Grammar School and subsequently proceeded to Cambridge, where he went into residence in Caius College. After taking his degree in Arts, Harvey proceeded to Padua in North Italy for the study of medicine, as the English universities in those days made provision for the granting of medical degrees, but not for the courses of instruction leading up to them.

At that time Padua was in the very hey-day of its prosperity and pupils flocked to it from all over Europe —a special attraction being the presence of Fabricius of Aquapendente, a worthy successor in the chair of anatomy to the celebrated Vesalius, the father of modern scientific anatomical study. After studying for five years at Padua Harvey returned to England, received the M.D. degree from the University of Cambridge, and subsequently settled in London where he obtained a lecturership in the Royal College of Physicians.

For many years Harvey laboured in London, practising his profession successfully, lecturing at the College and above all devoting his spare time to carrying out a prodigious number of experiments. After about ten years of carefully conducted experimentation on the bodies of men and upon those of many different species of animals, Harvey began to teach his revolutionary doctrines at the College in 1616, but it was not until 1628, when he was absolutely certain that he had eliminated all sources of error and had considered all the criticisms of his colleagues in the College, that he gave the world his masterpiece, commonly spoken of as *De Motu Cordis.*

After its publication he continued his experimental work which led to his producing a remarkable book on the generation of animals. In this book Harvey first formulated the now generally accepted doctrine of epigenesis or development of the body by a process of differentiation from a simple germ. That eminent zoologist, the late Professor Huxley, was of opinion that Harvey's work in this connexion was of even greater importance than his better known work on the circulation of the blood. Harvey died in 1657 in his eightieth year.

Having briefly outlined his career I now turn to his accomplishments. What do we mean exactly when we say that Harvey discovered the circulation of the blood?

Before Harvey's time all the facts later known by him concerning the structure of the heart and blood-vessels had already been discovered, and indeed more than one writer had stated his belief that blood passed from the right side of the heart through the lungs and thence to the left side of the heart, but no experimental proof of this had been offered. Although anatomists had managed to discover all the important facts concerning the structure of the heart and blood vessels their ideas with regard to how they worked were totally wrong. To anyone who knows of the very high standard of professional skill of Vesalius and Fabricius it is amazing that they remained in ignorance of these matters and a most important object lesson is to be drawn from this.

At that time and for many centuries before, medical thought and teaching were entirely dominated by the writings of one man—Galen of Pergamum, who had lived in the second century of the Christian era. The works of this man came to be regarded as canonical, criticism of the views contained in them was regarded as medical blasphemy, and even when some of the descriptions of the structure of the body contained in the books of Galen were shown by dissection to be inaccurate there was a strong tendency to ignore facts and to cling to the doctrines of the Master. According to Galen the blood, after concoction in the liver, flowed to and fro in the arteries and veins independently after the manner of the ebb and flow of the tides. He supposed that there was an important connexion between the right and left sides of the heart by means of invisible pores and that spirits of three kinds—natural, animal and vital—were added in different parts of the body.

Harvey broke away from the usual subservience to the views of Galen. His long series of physiological experiments were so admirably conducted and so clearly recorded that they may be said even now to be a perfect example of how biological research should be carried out. Harvey found that one, and only one, state of affairs could explain satisfactorily all his experimental results, namely that the heart must be the prime mover of the blood, that it must pump the same blood over and over again, that the blood leaving the right side of the heart must pass through the lungs into the left side of the heart, and that the blood which leaves the left side of the heart by way of the arteries must eventually find its way into the veins and come back to the right side of the heart once more, *having a motion as it were in a circle.*

Now when we consider that Harvey had no compound microscope at his disposal, that he therefore

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

could not see the minute blood vessels which connect the ends of the arterial branchings to those of the veins, and when we dwell on the fact that at that time oxygen had not been discovered and that therefore respiration was a function unknown, we must marvel at the extremely high standard of excellence of Harvey's experiments and at his powers of reasoning which led him to his conclusions. No person claiming to have received an education in science should fail to read an English translation of Harvey's book; it can be read through in an evening. It records in a simple and easily understood fashion one of the first and most important attempts to wrest knowledge from nature by means of careful experiment. Using experimental data Harvey showed that the actual quantity of blood leaving the heart at each beat, at the velocity at which he computed it must attain, could only arise from blood flowing back from the veins into the heart from a common circulating stock—this observation constituting one of the first applications of the idea of measurement to a biological investigation.

Having, inevitably, no conception of the function of respiration Harvey was, of course, unable to give a correct explanation of the object of the passage of the blood through the lungs.

Now although the discovery of the circulation of the blood was of supreme importance to physiology and to medicine, standing, as it has been put, in the same relation to these sciences as did the discovery of the magnetic compass to the science of navigation, it does not constitute Harvey's chief claim to rank with Galileo, Darwin and Newton as an outstanding leader in the advancement of science. His claim rests rather upon the attitude which he adopted towards the writings and dicta of the recognised authorities of the time, on the experimental methods which he devised for the solution of the problems confronting him, and on the clear-headed inductive reasoning which led him to his conclusions.

My reason for making William Harvey the subject of this address is not only that it is incumbent on us to recall to our memories at this time one on whose work our science and art is founded, but also that I think that we can find in Harvey's writings and methods many points which are very applicable to the medical problems facing us in the Indian Empire to-day.

We have seen that for very many years before Harvey was born progress in knowledge of the working of the body was definitely hindered, nay, rendered wellnigh impossible, by undue reverence for the writings of men who, although hampered by inadequate means of investigation, had centuries before formulated doctrines with regard to bodily structure and function. Instead of discarding what could easily have been proved to be wrong, men shut their eyes to any newly discovered facts which did not fit in with the doctrines of the Ancients.

We have in the Indian Empire to-day an exactly parallel situation.

Many hundreds of years ago when the inhabitants of most of those parts of the world to which the majority of scientific investigators now belong were rude and illiterate savages, there were in India as in China and other parts of the Orient many distinguished thinkers and workers in medicine and surgery as in other departments of learning. In India medical historians look back with justifiable pride on such stalwarts as Susruta, Charaka and Vagbhata who, nearly two thousand years ago, had made considerable progress in medicine and surgery. These Indian workers, however, have shared the fate of Galen in the West, and exponents of national Indian medicine are now engaged in teaching and in basing their practice on the archaic physiological and pathological doctrines laid down in the original Sanscrit so many centuries ago, and in explaining away any glaring discrepancies between their own doctrines and modern scientific discoveries by finding new and hitherto unthought of meanings for old Sanscrit words.

The whole of the Ayurvedic system of medicine is founded on the Tri-Dosha pathology according to which all disease is the result of the disorder of one or more of the three attributes of living matter—wind, water and bile. Ayurvedists' conceptions of the nature of disease have not advanced during the past thousand years, although the claim is made that all modern scientific knowledge is to be found in ancient Sanscrit documents if only they could be translated properly. The ease with which exact Sanscrit equivalents are found for every new term introduced to cope with modern scientific advance, such as hormone, vitamin, sympathetic system and vagotonia, makes one wonder if similar equivalents cannot also be found for such terms as sparking plug, thermionic valve and cathode ray, to bolster up the claims for the omniscience of the ancient Hindus in every branch of human knowledge.

Like Harvey one would say *I do not think it right or proper to take from the Ancients any honour that is their due,* and I would be the last person to detract from the achievements of the Ancients who, with the limited means at their disposal, seem to have accomplished marvels.

At this point it is convenient for me to define "modern scientific medicine."

By "modern scientific medicine" I mean "the prevention, alleviation and, if possible, cure of disease by any means which can be demonstrated to be efficacious."

It is founded on anatomy and physiology, that is the scientific study of the structure and functions of the body; on pathology,—the study of abnormal structure and function; on pharmacology—the study of the actions of drugs on the normal and abnormal body; and on psychology and psycho-pathology—the study of the normal and abnormal mind.

Stress must be laid on the fact that much of our progress depends on the application of advances made in the two basic sciences—chemistry and physics. Help is gratefully received from any source whatsoever, many of the most important advances being made by men with qualifications in pure science only, and this line of advance becomes more important every year on account of the fact that science is becoming so highly specialised that it is impossible for any one man to do more than have a thorough knowledge of one small branch. Nor must we forget the important advances in therapeutics which have been made from time to time by rude and uncultured natives in all parts of the globe, two of the most important being the discovery of the efficacy of cinchona bark in malaria by the South American Indians and of the virtues of foxglove leaves by English rustics. If at any time an accepted theory proves to be incorrect it is discarded or modified and a better one is substituted, for the chief use of a theory is to provide a working explanation for a particular group of phenomena until a better and more accurate explanation can be found. Compare this state of affairs with medicine according to any of the numerous systems which have had their vogue—the Ayurvedic system, the Homœopathic system, the Allopathic system—each based on a specific and unalterable doctrine—and pursuing an unaltered course throughout the years. Harvey, with his intimate acquaintance with the evil wrought by the doctrine of "Hands off the Ancients" was constrained to write in the introduction to *De Motu Cordis; true philosophers who are only eager for truth and knowledge never regard themselves as already so thoroughly informed but that they welcome further information from whomsoever and from whencesoever it may come. Nor are they so narrow minded as to imagine any of the Arts or Sciences transmitted to us by the Ancients in such a state of forwardness or completeness that nothing is left for the ingenuity and industry of others. Neither do they pin their faith to others' precepts in such wise that they lose their liberty and cease to give credence to the conclusions of their proper senses. Neither do they swear such fealty to their mistress—Antiquity—that they openly and in sight of all desert*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"TRADE MARK NORMACOL" BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

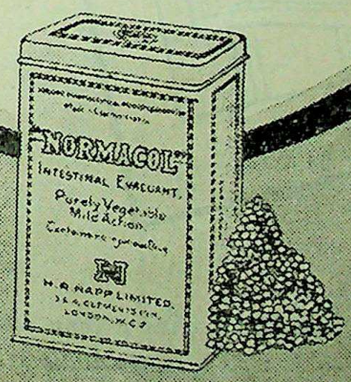
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H. R. NAPP LIMITED,

3 & 4, Clements Inn, London, W.C.2.

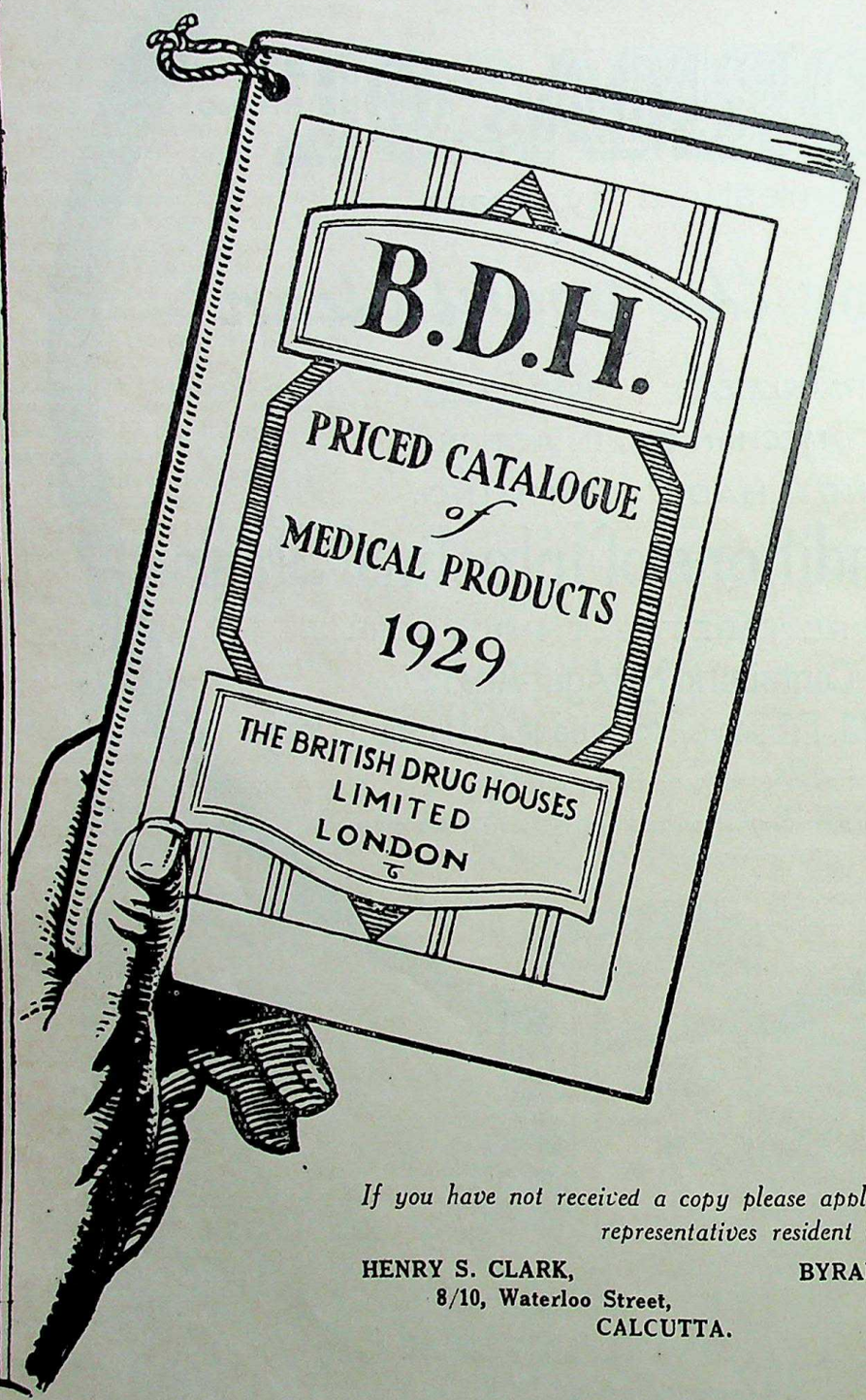
Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two lines)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A NEW EDITION OF

The B.D.H. Price List
— OF —
Medical Products



Several new B.D.H. medical products which have been issued since the publication of our previous catalogue are included in this new edition. All of them conform with the high standards of purity and therapeutic activity set for all B.D.H. medical products.

If you have not received a copy please apply at once to one of the B.D.H. representatives resident in India :

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham Bldgs.,
Parsee Bazar Street,
FORT, BOMBAY.

THE BRITISH DRUG HOUSES
LIMITED
LONDON

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

their friend Truth. Neither do they think it unworthy of them to change their opinion if truth and undoubted demonstration require them to do so: nor do they esteem it discreditable to desert error though sanctioned by the highest authority. Yet to-day in the Indian Empire we have large numbers of the intelligensia demanding that particular systems of medicine should be developed and subsidised by government on historical, sentimental and political grounds.

One even finds among the ranks of the Ayurvedists men who have been trained in modern medicine and who give "the partition of Bengal," "The Amritsar shooting" or some other political episode as the reason for their defection. What would one think if one heard that an eminent Indian physicist had abandoned the atomic theory as a protest against diarchy, or that a well-known mathematician had denied that three is the square root of nine as a protest against high railway fares? These examples are ridiculous, but their exact counterpart in medical science is accepted as a necessary consequence of political unrest.

Here I must make it quite clear that there is a profound difference between "indigenous medicine" and "indigenous medicines."

It is more than a little unfortunate that the word medicine should be used in two entirely different senses: in the first place as a designation for the art and science of preserving and restoring health, and second to denote the drugs and other therapeutic substances used in that art and science.

One commonly hears persons who do not fully understand the distinction assert that the indigenous systems of medicine should be supported and encouraged because drugs derived from fruits and herbs growing in the country must be cheaper and probably more efficacious than those brought from abroad. It cannot be too fully recognised that modern medicine is only too willing to try and to employ any medicinal substance if efficacious, from whatsoever source it may be obtained; and for many years the most distant portions of the earth have been ransacked for any substance which may be of even the slightest therapeutic value; and although the tendency nowadays is to synthesise medicinal substances artificially in the laboratory the search still goes on. To assume then, as many persons do, that there is something incompatible between modern scientific medicine and the employment of efficacious indigenous remedies is just as wrong as is the assumption that the best remedies for the diseases prevalent in any particular country must necessarily be found growing from the soil of that land. We know and even Ayurvedists will, I think, admit that medicine was practically powerless to deal with three of the most deadly diseases of the East—malaria, amœbic dysentery, and kala-azar—until non-indigenous drugs were introduced by modern scientific practitioners. For the effectual treatment of malaria we must use one or more of the derivatives of cinchona bark obtained from a tree indigenous in Peru in South America, to which continent we are also indebted for ipecacuanha and its potent derivative emetine. We can now save thousands annually in India and Assam from death from kala-azar—a disease with a recovery rate up to 1916 or so of almost nil—for with the new synthetic antimony compounds we are able to get a recovery rate of over 90 per cent.

A very different matter, however, from the employment of native remedies is the use of indigenous systems of medicine built up on a foundation of demonstrably wrong and non-progressive anatomy, physiology, and pathology, and owing its all to the dead and silent brains of long-gone ancient physicians. Nor does it seem to me to improve matters to lay down that in schools of Ayurveda and other indigenous systems modern anatomy and physiology should be taught in the earlier classes before the student passes on to learn the ancient system. To me it seems just as useless as it would be to institute a school of geocentric astronomy with the proviso that the first year of the proposed course should be devoted to acquiring a sound knowledge of mathematics and physics.

"Doctrinaire formula worship—that is our real enemy" says Neuberger, and this is especially true when the health of the people of India seems to be in danger of being entrusted to devotees of antiquated, worn out and never changing cults. Let us in the Empire of India ever keep before us those words of Harvey which should be inscribed in letters of gold over the entrance to every teaching institution—*Search out and study the secrets of nature by way of experiment*, and let us ever remember Harvey's words which we find in the introduction to *The Generation of Animals*. "*Without the due admonition of the senses, without frequent observation and reiterated experiment our mind goes astray after phantoms and appearances. Diligent observation is therefore requisite in every science and the senses are to be frequently appealed to. We are, I say, to strive after personal experience —not to rely on the experience of others—without which, indeed, no one can properly become a student of any branch of natural science. I would not have you, gentle reader, to take anything on trust from me— I appeal to your own eyes as my witness and judge. The method of investigating truth commonly pursued at this time is to be held erroneous and almost foolish, in which so many enquire what others have said and omit to ask whether the things themselves be actually so or not.*" Surely these words written three hundred years ago are highly applicable to conditions in India to-day.

From what I have said you will, I hope, readily understand why Harvey's name is revered in the world of science—not just because he was the discoverer of the circulation of the blood, nor because he was the first to introduce the idea of epigenesis into biology, but mainly because he set flame to the torch which lights the only safe path to the discovery of Truth in biological science—diligent and patient experimentation. Mark too how, no doubt partly as the result of the application of Harvey's own methods, the world of science has dealt with those portions of Harvey's works in which, in the light of later scientific discovery, such as those in oxidation, combustion and respiration, we now know that wrong conclusions were reached. These wrong views have been discarded without even a passing regret. How different from the fate of the mistaken views of Galen and of the earlier Indian physicians whose doctrines were and are still upheld on sentimental and political grounds. I say it would imply no disrespect for national heroes, no act of treachery or lack of patriotism on the part of the doctors of any particular nation to-day to abandon exploded theories instead of clinging to them on patriotic grounds.

Before concluding I should like to refer briefly to another aspect of Harvey's life—namely that of his attitude towards his brother physicians and fellow practitioners.

Towards even his most bitter opponents he maintained an attitude of courtesy. In his own words: *To return evil speaking with evil speaking I hold to be unworthy of a philosopher and of a searcher after truth. I believe I shall do better and more advisedly if I meet so many indications of ill breeding with the light of faithful and conclusive observation.*

Harvey was a generous man. He built at his own expense the museum and library of the Royal College of Physicians and handed over during his lifetime his patrimonial estate of Burmarsh in Kent, endowing also the annual feast on St. Luke's day, at which banquet the annual Harveian oration is delivered.

Harvey stipulated that in this oration the speaker should exhort the Fellows and Members of the said college not only to search out and study the secrets of nature by way of experiment but also *for the honour of the profession to continue in mutual love and affection among themselves, ever remembering that Concordia res parvæ crescunt, discordia magnæ*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

dilabuntur...(By harmony even small things become great but discord brings even great things to ruin).

There is, I think, to-day a great need in the Indian Empire for the development of more "mutual love and affection" between medical men, and "for the honour of the profession" it is to be hoped that something of the Harveian spirit will spread throughout our ranks in India, as I can imagine nothing more derogatory to the dignity and honour of our noble profession than the bickering, snarling, and intriguing, which are rife to-day between government and non-government doctors, between the different grades of practitioners, and between the adherents of ancient and modern methods of treatment. Fortunately we in Burma are not yet seriously embroiled in these matters, but I am sorry to say that in some parts of India a bitter strife goes on. May it soon cease, in order that the true objects of the medical profession—the common good and the public weal—may be restored to their proper places in the forefront of our activities.

Current Topics.

Tbc—Protective Vaccine with dead Tubercle Bacilli.

By H. LANGER.

Therapie der Gegenwart, 1928, November.

IN spite of all counter attacks, Langer is still of the opinion that immunity can be attained by means of dead tubercle bacilli. To prove this statement he has again conducted experiments on rabbits. The animals were given a dose of 5 mgs. of the protective vaccine. After an interval of 2½ months the animals were infected with 0.0005 mg: of tubercle bacilli by intravenous or subcutaneous injections. Amongst the group of animals which received intravenous injections of tubercle bacilli, the control animals died after an average of 30 days, whereas the animals which had received the protective vaccine lived for an average of 70 days. In the group of animals which were injected with tubercle bacilli subcutaneously, the control animals lived for 68 days, whereas those animals which had been given protective vaccine lived for 270 days, one even living as long as 435 days. It has been shown that Langer's vaccine is free from harm. Some authors have been able to protect those infants who come out of tuberculosis-infected homes from an injection of this disease, by means of Langer's vaccine.

The Medical and Surgical Dossier or Patient's Case-Sheet.

By SIR MAURICE ABBOT-ANDERSON, C.V.O., M.B., B.S., ETC.,

and

E. P. SCOTT, M.B., B.S., M.R.C.S., L.R.C.P.

(*The Practitioner,* November, 1928, p. 180.)

EVERY medical practitioner must often have experienced the difficulty of obtaining from patients an accurate history of their previous illnesses. This state of affairs is no doubt largely due to the fact that the physician or surgeon in charge of a case does not enlighten the patient sufficiently as to the trouble from which he is suffering. This information can quite easily be given, and in such a way that it can readily be understood by the average lay intelligence. If this were done, the general public would become still more emancipated, the patient would be saved considerable expense, and the physician a vast amount of time, to say nothing of the increased accuracy that would be achieved in diagnosis.

We have been forcibly struck by the ignorance which prevails amongst all classes of patients concerning their previous illnesses, and also in respect of the details of the treatment they have received, including the nature of operative measures that have been performed. Another important factor is the delay frequently caused by the necessity for communicating with physicians and surgeons as to the medical history of patients formerly in their care.

It seems to us a most extraordinary feature of every-day life that people submit themselves to treatment and to surgical procedure without really taking any-thing but an apathetic interest in the diagnosis and treatment of their cases. The following instances actually came under our notice recently:—

Case No. 1.—We were asked to see a lady suffering from abdominal pain; she had a median abdominal incision, and marked tenderness in the right iliac fossa. Our diagnosis would have been chronic appendicitis, but we were informed that her appendix had been removed some years previously. In the course of examination later, an opaque meal revealed a large kinked appendix, which was removed. It was subsequently discovered that the earlier operation had been performed for removal of the right ovary, together with the right Fallopian tube.

Case No. 2.—We recently saw a lady with a scar 11 inches long extending from the epigastrium to the symphysis pubis. She was quite unable to give us any information whatsoever as to the operation which she had undergone; all we could extract from her was that she "thought she had gall-stones." We found out from the surgeon who had operated that a partial gastrectomy had been performed, and that the gall-bladder had been left severely alone.

Case No. 3.—A further instance was that of a lady with a large scar in the right lumbar region. Why she was operated on she did not know, but it had been done in India by a surgeon whose name she had forgotten and who, she thought, was now out of practice, or possibly dead.

Medical instances are too numerous to relate, as, for example, the patient who tells the doctor that he has had vaccines, but for what he does not know! It is all very difficult and irregular, but could so easily be rectified if, in the first place, the physician or surgeon would definitely explain his illness to the patient; and, secondly, if the patient would insist upon having some record of his illness—a record to which he surely has a right. We would therefore suggest, with great temerity, that a written report or statement might be given to a patient after any more or less serious illness or operation, which report could easily and readily be produced in case of future need.

While discussing this subject, would it not be an excellent thing if the lay public were encouraged to take a little more interest in their general health (excluding, of course, that minority who constantly consult doctors, and of whom we all have experience), and to submit themselves regularly for general examination? In America, we believe, this is a usual practice. It is the common experience of every medical man to see patients who wonder why they have been turned down by an insurance company on the ground of ill-health; possibly an examination reveals that the blood pressure is too high, that albumen or sugar is present in the urine, or that some other physical sign exists which apparently gives no inconvenience, but is the distant though definite signal of "rocks ahead."

We can foresee in the near future a state of affairs when every doctor will be compelled to give a written report to each patient, and when every patient will be provided with a medical "dossier," which he will keep in his own care—a procedure which would obviously be in the best interest of the patient.

This dossier will be produced voluntarily by the patient, when asked for by the doctor he consults. It will very greatly help the physician in his work, and will considerably aid in safeguarding patients against errors of diagnosis. Think, for instance, of the importance of recording the fact that a certain patient has a definite idiosyncrasy to some particuar drug, or

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

Vide Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Oral Sepsis

The term Oral Sepsis was introduced by Dr. William Hunter in 1900 and sponsored by Sir Thomas Barlow in his recognition of it as the greatest septic infection in medicine. As the years passed a growing circle of believers joined in appreciation of Dr. Hunter's work and nomenclature, and in 1910 Dr. Mitchell Bruce in his presidential address said:

> "Its effects are so widespread, so multiple, and frequently so grave as to make us ashamed of our previous blindness to a common source of blood infection staring us in the face all these years."

In view of the world-wide interest now taken in oral sepsis, the following extract from a letter, recently received by the proprietors of Dimol from a distinguished Fellow of The Royal College of Surgeons, should make a strong appeal to all Medical and Dental Practitioners.

> "I have been using Dimol (tablets) and there is no doubt whatever that it is the very thing I have been trying many years to obtain, in order to settle a point which I have been considering for a long time.
>
> "I believe it is generally assumed that the organisms which are responsible for Dental Caries and Pyorrhœa find their way to the intestine, and there set up putrefaction and fermentation, which cause the common symptoms of mal-digestion, and subsequent toxæmia (lassitude, headache, etc.). There seems to me another possible theory, viz., that Pyorrhœa is a *blood infection*, and that this infection may be directly attributable to a bacterial disturbance in the intestinal tract. I am inclined to this view because during a long career I have come across so many young people suffering from the intestinal symptoms first, and *then* getting Caries and Pyorrhœa.
>
> "I am personally most grateful for Dimol."
>
> ———, F.R.C.S. (Eng.).

The efficiency of Dimol in the treatment of putrefactive and other bacterial invasions of the intestinal tract is conclusively told in the interesting clinical reports which, together with a brochure dealing with the pathological significance of the intestinal toxæmias, will be sent to any medical or dental practitioner on request.

Dimol Laboratories, Ltd., 40, Ludgate Hill, London, E.C.4.

Dimol may now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

that another is a subject of hæmophilia. Records of exanthemata and vaccination would also be valuable.

It is obvious that there are certain drawbacks. A patient might resent a record that he had been a sufferer in his youth from venereal disease, but this could be got over in one case by merely stating that the Wassermann reaction had been absent or present on such-and-such a date, and other conditions could be indicated by similar indirect methods. Mention of the fact that the patient had been attended for alcoholism would also naturally be resented, but in drawing up the case-sheet some such indication as C_2H_6O, could be used. It would probably not be in the best interests of the patient to mention the fact that he or she had been operated upon for malignant disease, but here again a subterfuge would have to be adopted.

We would suggest that the form of the case-sheet should be determined by a committee of leading physicians and surgeons, and that this committee should invite suggestions from the profession generally. The scheme should also be submitted to eminent laymen, and an opinion should be taken as to the legal responsibility of the medical man signing the dossier. This, in our opinion, should be a privileged document, and it should be made compulsory by law that every doctor attending a patient should ask to see the patient's case-sheet. If the patient did not possess one, it would then be the doctor's legal obligation to provide this, and to complete his signed report as indicated on that case-sheet.

In time these medical records would be of great value statistically, and might even be of considerable importance from a medico-legal point of view. The whole subject has a wide bearing, but there is no doubt that such a dossier would be invaluable to its possessor.

The Origin of Civilisation.

(*The Med. Press and Circular,* October 17, 1928.)

AMONG other interesting theories suggested by Professor Elliot Smith is that the determining cause of the origin of civilisation was the presence of an abundant crop of wild barley on the banks of the Upper Nile, leading to the permanent congregation there of the nomadic races who inhabited that portion of the globe. An assured food supply led to an increasing population, the storage of the surplus food against the emergencies of climate, the cultivation of the arts and crafts, and the invention of an alcoholic drink, to which was attributed in the primitive mind the power of prolonging life, and which thus became associated with the idea of immortality. The almost universal presence of this and other beliefs in the ancient civilisations is considered by Professor Elliot Smith to be strong evidence against the independent origins of civilisation in various regions of the earth, and leads him to postulate the diffusion of culture from one primitive foundation. According to the older view, it was supposed that the human mind would react in favourable circumstances to the same instincts, and thus lead to the evolution of independent foci of civilisation, and in the end arrive at conditions of life varying only in the degree of culture.

Treatment of Ascites by Novasurol and Ammonium Chloride.

By SIR JOHN F. H. BROADBENT, M.D., OXF., F.R.C.P. (Lond.)

(*Lancet,* June 30, 1928, p. 1326.)

NOVASUROL is a double salt of sodium mercurichlorphenyl oxyacetate with diethylbarbituric acid, and contains 33.9 per cent. of mercury. It is soluble in water and can be given by intravenous or intramuscular injections. It may be given in doses up to 2 c.cm. intramuscularly at intervals of three to seven days. Its tolerance should first be tested by giving 0.5 c.cm. intramuscularly.

Ammonium chloride is given by the mouth in divided doses up to grs. 150 in the 24 hours. I have found that 1 c.cm. of novasurol, followed by grs. 120 of ammonium chloride daily, was efficacious in producing marked diuresis.

The treatment of ascites by repeated tappings or ordinary diuretics is admittedly unsatisfactory. The explanation of the remarkable results obtained by the administration of novasurol and ammonium chloride is not clear. Rowntree, in addition, restricted the intake of water and salt, but this does not appear to be essential. Keith and Whelan came to the conclusion that the action of these diuretics was not limited to the kidney, but that extrarenal factors play an important part, and it is obvious that the transference of the fluid from the peritoneal cavity or the tissues to the blood stream is the primary difficulty and is essential for a satisfactory result.

Dr. George Curtis, described some experiments he had made on rabbits with the diuretic euphyllin. He found that during diuresis electrolytes form the greater part of the solids excreted in the urine, and that the chlorides calculated as sodium chloride, predominate. The sodium chloride content of the blood also rises. He concluded that under the influence of the specific diuretics permeability changes are initiated in the tissues, resulting in a rapid passage of electrolytes, principally chlorides, into the blood stream from the tissues. These stimulate the kidney and pass into the urine in large amounts. He found that when diuresis did not occur the marked increase in chloride excretion did not take place.

Irradiated Ergosterol as a Wound Dressing.

(*From The Prescriber,* September, 1928, Vol. XXII, p. 299.)

C. J. BOND (*Brit. Med. Journ.,* 3rd March, 1928, p. 339-340), having had successful results from the use of cholesterol and paraffin as a wound dressing, and having noticed that the results were still better when ultraviolet rays were used in addition, was led to try irradiated ergosterol ("radiostol") in oil, diluted with liquid paraffin, and soaked in gauze. He found that such a dressing not only reduces infection and promotes healthy granulations, but also stimulates the ingrowth of epithelial cells from the margin, and so favours the healing process. Bond thinks that further research should be made in this direction, and he suggests certain lines along which such research might be made. In a further note (*Brit. Med. Journ.,* 14th April, 1928, p. 642). Bond describes experiments which tend to show that this action of irradiated ergosterol on wounds and granulating surfaces may be due to the peroxide or ozonide of ergosterol rather than to vitamin D.

Albuminuria and Glycosuria.*

By ADOLPHE ABRAHAMS, O.B.E., M.D. (Cantab.).

(*The Medical Press,* November 28, 1928, p. 446.)

THERE cannot be one practitioner who at some period or other of his career has not found reason to regret the omission to perform the elementary tests for albumin and sugar in the urine; and he is fortunate indeed if the omission occurs on a relatively unimportant occasion. This examination is in fact a fundamental precaution, whatever the condition from which the patient is suffering or the complaint he advances: and although I make no pretence to advance any new information, and can only claim the attempt to provide a convenient summary, there is no need to apologise for the elementary character of my subject. This is logically considered under two heads: the identification of albumin or sugar in the urine; and, secondly, the significance of their presence.

* Post-Graduate Lecture delivered at Westminster Hospital, 18th September, 1928, in connection with the Fellowship of Medicine.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Albuminuria means the passage into the urine of protein that is coagulable on boiling. The protein substances that may be encountered are serum proteins—serum albumin and globulin; compound proteins, nucleo-albumin and mucins; and proteolytic products—albumoses.

The familiar tests which have successfully withstood the attempted introduction of others, perhaps more delicate and less equivocal, are the application of heat and the addition of nitric acid; or, as they are popularly termed, the coagulation and the nitric acid tests. A urine with turbidity due to urates becomes clear on being heated; a cloudy precipitate which may subsequently form will be due to earthy phosphates or to coagulated albumin. The former is at once dissolved by a few drops of acetic acid, the latter becomes denser. It is well to add a few drops of acetic acid to the urine before boiling to ensure sufficient acidity. This precaution is in itself a test, as a precipitate which forms with acetic acid in the cold, as it is termed, is identified as nucleo-protein, which may be mistaken for albumin, but is of no pathological significance. A final precaution is to recognise an unusual phenomenon, a precipitate which appears at a comparatively low temperature and disappears on further heating. This is the Bence Jones albumose, which is an accompaniment of multiple myelomata, and is also found in some cases of leukæmia. It may be said that the average onset of coagulation of albumin is 75°C.; the Bence Jones body begins to precipitate out at 50°C.; at 58°C. it is well developed: at 70°C. clearing has already begun, and on boiling, the liquid should again be nearly if not quite clear. It is a rare phenomenon, but it is peculiarly striking. I once identified it in a routine examination of a medical man, who believed himself to be in perfect health, and in whom three months later symptoms first appeared.

The nitric acid test is, in my opinion, less convenient. An excess of urates may be precipitated, and so may nucleo-protein. There are also other fallacies, e.g., precipitation of copaiba resin, if the patient is taking this drug, and urea itself may be precipitated as the nitrate.

As regards genuine albuminuria, the percentage is usually below one and rarely exceeds two. The actual loss to the body is therefore of little importance, and is easily replaced. It is the significance which is of consequence. It may at once be said that the presence of albumin is not necessarily pathological, still less is it an indication of diseased kidneys. It is convenient to speak of pathological and non-pathological albuminuria; the latter may conveniently, if perhaps unscientifically, be called "physiological."

Pathological albuminuria occurs in nephritis, in other diseases of the kidney, e.g., tuberculosis and new growth, in suppurative conditions of the lower urinary tract—cystitis, urethritis; in hæmorrhage from any part of the urinary tract; in damage to the renal epithelium by toxins, exogenous or autogenous—this category will naturally include a very large number of conditions, e.g., alcoholism, burns, diabetes, gout, lead, mercury and arsenic poisoning, syphilis, fœtal products in pregnancy. Albuminuria occurs in many of the acute specific fevers, particularly scarlet, diphtheria, variola, erysipelas; also in pneumonia and typhoid, less so in influenza and measles. In certain nervous disorders, apoplexy and convulsions; in circulatory disturbances, whether due to heart or lung disease, or to pressure on or obstruction of the inferior vena cava; ascites, ovarian tumours or cysts may be mentioned in this category. It is clear that a variety of causes may be responsible for the albuminuria of pregnancy, pressure of the uterus on veins, excessive strain on the placental circulation, the direct action of fœtal products on the kidneys, not to mention the possibility of contamination of the urine by small hæmorrhages or vaginal discharges.

It will be evident that the significance of albuminuria in any one of these numerous conditions will depend upon the recognition of the cause which is primarily responsible. In some instances a clinical examination suffices, in others a microscopical examination revealing the presence of casts, blood-cells, pus, organisms, will indicate the line along which further investigation should extend. It is impossible to consider such a vast subject even superficially, nor for the present purpose is it necessary.

To turn now to the condition regarded as non-pathological albuminuria. Some idea of its uncertain ætiology is afforded by the extensive terminology attached to it—physiological, adolescent, intermittent, remittent, cyclical, postural, functional, alimentary, the albuminuria of exercise.

In many instances there is a high percentage of globulin or euglobulin, and precipitation by acetic acid in the cold may be produced. In some instances the albumin may be detected only at certain hours of the day, being usually absent during recumbency, to appear during the active hours of the day. It is associated, therefore, with the erect attitude and also with exercise. In some cases there is also a paroxysmal hæmoglobinuria. In some cases the albuminuria is induced by a cold bath, or even a surface chill. All kinds of explanations are forthcoming. That posture has a distinct effect is indubitable, and it appears that lordosis of the spine is of consequence, as this exerts its influence when the subject is erect. The left renal vein is then compressed between the spine and the aorta, and it has been shown on occasion that such albuminuria may be derived from the left kidney only. Such a mechanical effect may be partly responsible for the albuminuria of pregnancy.

But even if posture and corresponding circulatory disturbance play a more or less indispensable part in the production of albuminuria, there must be an appropriate condition of the blood plasma. The subject usually displays many manifestations of vaso-motor instability, and the albuminuria may often be checked by the administration of calcium lactate. Certainly it may be checked by no other means short of perpetual recumbency, and the chief importance is to recognise the innocence of the condition, and not to restrict the subject's activities or in any way to prejudice him. This circumstance acquires particular importance in relation to exercise. The albumin which so commonly results after exertion is now regarded as negligible. It is found to be invariable in oarsmen, and in boys after any form of exercise; in my experience it is less common in adults who indulge in track athletics. As casts and blood are sometimes found with albumin, it is, perhaps, going too far to include these circumstances as functional only, but any nephritis which results would appear to be of the most trivial and temporary character. There appears to be no evidence that a so-called alimentary albuminuria ever occurs as a leakage when an excess of protein, e.g., eggs, has been taken.

GLYCOSURIA.

That glycosuria is not diabetes is nowadays an elementary truism. Our eminent predecessors, notwithstanding the lack of assistance from blood-sugar estimations which are a comparatively recent introduction, realised the existence of several conditions in which glycosuria was a transitory and trivial phenomenon, and even of conditions in which sugar was excreted in comparatively large quantities, yet without the usual pathological accompaniments of diabetes mellitus. To the latter the term *diabetes innocens* was sometimes applied, a term which has now been replaced by "renal glycosuria," as removing any suggestion of a real diabetic condition and introducing a renal possibility, a consideration to which I shall shortly return.

Dextrose (or glucose) is the important carbohydrate excreted. Its identification as a substance which reduces Fehling's solution permits confusion with other reducing substances which may also be found in urine, some of which are carbohydrates, such as lactose, lævulose, maltose, and pentose. Lactose may be found in the urine of pregnant or puerperal women, lævulose and maltose as rare metabolic disturbances, and pentose still more rare. Another substance which reduces

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Insomnia

disappears after

MEDINAL

Schering

Medinal is very readily soluble in water and is accordingly rapidly absorbed and excreted. There is no danger of any cumulative toxic effect or of disagreeable secondary effects. Taken in the ordinary prescribed doses, Medinal is absolutely harmless. Hypnosis is rapid and intense, and the effect of Medinal is also sedative and calming. The most convenient time for the dose is 2—3 hours after the evening meal. Medinal is procurable in tubes containing 10 tablets of 7½ grains each. Samples and literature will be willingly placed at the disposal of medical men, on application being made to:

SCHERING-KAHLBAUM (INDIA), LTD.

Telephone: Cal. 4770
Telegrams: Aeskulap

CALCUTTA

4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

F. SCHWERZMANN & CO.,
Rangoon (Burmah):
26, Merchant Street.

2068701

Schmauss.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

for sleeplessness and pain

remember that Allonal "Roche" is now the most widely used non-narcotic remedy. Allonal has greatly decreased the use of narcotics—opiates and the older hypnotics. Besides allaying nervousness, fear and restlessness, and, inducing refreshing sleep, Allonal alleviates pain. It has been used with success in cases where regular administration of morphine over long periods had previously been the only effective treatment.

SAFE :: QUICK :: EFFECTIVE :: NON-NARCOTIC

SEDATIVE :: ANALGESIC :: HYPNOTIC

Allonal 'Roche'

is especially indicated and highly serviceable in:

Insomnia	Neuralgia	Migraine
Nervousness	Headache	Carcinoma
Psychoses	Sciatica	Hiccough
Menopause	Neuritis	Sea-sickness
Dysmenorrhoea	Arthritis	Alcoholism
Dental pains	Tabes	Drug addiction

Pre- and post-operative pain
Vomiting of pregnancy

F. Hoffmann-La Roche & Co., Ltd.

Manufacturers of

Digalen "Roche," the standardised cardiotonic—Omnopon "Roche," the total opium alkaloid preparation—Sirolin and Thiocol "Roche," the safe, efficient remedies for respiratory diseases—and other high-class specialities and fine chemicals.

Roche Agents in India:

Volkart Bros.

P. O. Box 606, Calcutta
P. O. Box 22, Karachi
P. O. Box 199, Bombay
P. O. Box 45, Madras

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Fehling's solution is glycuronic acid, which may result from the administration of large doses of chloral hydrate. In addition, an imperfectly performed test may result in reduction from the presence of uric, hippuric, homogentisic and salicylic acids, of creatin, creatinin, xanthin, and other bodies of this composition. So far as the identification of glucose is concerned, the result of fermentation with yeast will exclude lactose and pentose, a rare product which may occur after the ingestion of certain fruits rich in arabinose, cherries, plums, and pears, and also spontaneously as a metabolic freak, particularly in Jews. Fermentation will also exclude the large variety of non-carbohydrate substances above enumerated. If any doubt still remains as to whether glucose or some other sugar is present, subsidiary tests may be employed, rotation of the plane of polarised light, or production of appropriate osazone crystals. But this is really within the realm of the laboratory worker and not of the clinician. As in general, reduction of Fehling's or Benedict's solution means glycosuria, it will be well to spend a few moments discussing the performance of these tests.

First of all, it should be remembered that glucose is present normally in urine to perhaps 0.01 per cent., that Fehling's test will detect 0.02 per cent., and Benedict's considerably less. The delicacy of the last-named is indeed an objection to its clinical application, although it is immune to fallacies. As a rule, a urine containing an appreciable quantity of sugar has a specific gravity above 1,025, but discovery of a lower specific gravity must not be interpreted as evidence that glycosuria is absent. It has been shown that 1 per cent. glucose may be present in a urine of specific gravity 1,007, and even 1,003. Another practical consideration is the advantage of employing a twenty-four hours' specimen for examination, since an isolated specimen may be free from an abnormality present only at certain times of the day.

If Fehling's solution is used, the two solutions should be kept separately and mixed only at the time of testing, as the mixed solution tends to become self-reducing. At the time of performing the test, equal parts are mixed and boiled, an equal quantity of urine is separately boiled and added, preferably a few drops at a time to gain some impression of the quantity of sugar present. Prolonged boiling with Fehling's solution of a urine containing uric acid or creatinin may lead to reduction which will not occur if the reagent and the urine are separately boiled and then mixed.

Benedict's solution requires exactness in use. Five c.c. of the reagent must be measured, and eight to ten drops of urine added. The mixture is boiled for two minutes. A green, yellow or red precipitate forms, according to the quantity of sugar present. An important advantage is that the other substances which reduce Fehling's solution give a negative result with Benedict's.

Fermentation by yeast has already been mentioned as a confirmatory test of the presence of sugar. It also affords a method of estimating the quantity. The rationale of the test is that owing to decomposition of the sugar the specific gravity falls; every degree of specific gravity lost represents one grain of sugar per ounce.

Now, admitting the existence of glycosuria, let us turn to the circumstances in which it occurs. In the majority of subjects, sugar appears in the urine as soon as the blood-sugar exceeds about 0.17 per cent., and if an opportunity is afforded to estimate the percentage of sugar in the blood, the comparative importance of glycosuria becomes known. For, on the one hand, we may find in an established diabetic that the blood-sugar is substantially above 0.17 per cent., and yet sugar does not appear in the urine, so that a dangerous degree of hyperglycæmia may be overlooked because glycosuria is not present. On the other hand, the opposite condition may be encountered when glycosuria occurs, although the blood-sugar never rises even to the normal maximum, 0.17 per cent. In this case some peculiar condition of the kidneys appears to be present, and the term leaky kidneys or renal glycosuria is employed. In the days which preceded blood-sugar examinations, such cases were regarded as diabetes, and treated quite unnecessarily by restriction or deprivation of carbohydrate. Their innocence was identified clinically by astute observers, who expressed their opinion by employing the term *diabetes innocens*. It may be added that a combination of diabetes with renal glycosuria may occur, but rarely.

The occurrence of glycosuria in cerebral tumours, epilepsy and nervous disturbances generally is very familiar. Such cases are the clinical representatives of glycosuria resulting from puncture of the floor of the fourth ventricle; the action is upon the sympathetic nervous system through the adrenals, and explains the temporary glycosuria which may result from excitement and other emotional disturbances.

Intermittent glycosuria is not infrequent in gouty subjects, and especially those addicted to alcoholic excess. It is sometimes (though not often) present in Graves' disease, presumably from antagonism of the thyroid and pancreas. For a similar reason glycosuria may occur in acromegaly.

The association with boils and sepsis is familiar. In children, glycosuria sometimes occurs shortly after an attack of pertussis.

Apart from the question of blood-sugar estimations, glycosuria acquires special importance when associated with the presence of acetone, *B*-oxybutyric and diacetic acids in the urine, and particularly the last two, since acetone may occur in the urine in a large number of relatively innocent conditions. In diabetes, the percentage of sugar bears no relation to the amount of diacetic acid excreted, but the presence of sugar encourages the test for *B*-oxybutyric acid which, although it cannot in itself intrinsically produce coma, is an essential factor. It is not strictly true to say that one tests for *B*-oxybutyric acid, for direct identification of this acid is very difficult. But since it is always accompanied by diacetic acid, the test for the latter by the simple addition of ferric perchloride is sufficient. The only fallacy in this test is the close similarity afforded by a urine containing the decomposition products of salicylic acid, which will be present if one of the coal-tar products has been administered. The colour is rather different, but sufficiently like for confusion if the possibility is forgotten. Naturally, prolonged boiling in the case of diacetic acid, which is volatile, destroys the colour which persists in the other instance.

Silver Nitrate in the Eye of the Newborn.

(*From The Prescriber*, September, 1928, Vol. XXII, p. 299.)

J. G. F. HEAL (*Brit. Journ. Ophthal.*, Jan., 1928, pp. 33-35), reports a case of ophthalmia neonatorum treated prophylactically with instillations of silver nitrate (1.5 per cent.) thrice daily. At least five instillations had been made before he was called in. The child had conjunctival hæmorrhage and steamy cornea on both sides; on one side the hæmorrhage was so persistent that chloroform had to be administered to enable the cautery to be applied to the bleeding points. Five weeks later the eyes were normal. The lesson to be learned from this is that silver nitrate should not be used as a prophylactic for the eye in a solution stronger than one per cent., and caution is needed when such solution is used more than once.

The Prevention and Treatment of Tuberculosis by an Immunizing Vaccine.

By NATHAN RAW, C.M.G., M.D., F.R.C.S., F.R.S.E.

(*The Practitioner*, September, 1928, Vol. CXXI, p. 149.)

THE medical practitioner is always deeply concerned when he is asked to undertake the treatment of a patient suffering from tuberculosis. He knows that, if the disease is not arrested in the early stages, it will progress with certainty to a fatal termination. In spite

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of an enormous amount of research going on in all parts of the world, we have reluctantly to admit that we have not yet obtained a specific remedy which will effectively destroy all the tubercle bacilli in the body without serious risk to the patient. We must therefore rely on producing a sufficient immunity in the tissues to resist the attack of virulent tubercle bacilli. This immunity can be obtained:—

(1) By increasing the natural resistance by means of increased nutrition and sound hygienic conditions.

(2) By producing an artificial active immunity in the tissues to the tubercle bacillus. It is to the latter (the production of active immunity) that I wish to direct the attention of the profession.

In considering this problem it is vital to appreciate the exact method by which the bacilli gain entrance to the human body, and, above all, the various types of bacilli which may affect it. The three principal types are as follows:—

(1) Typus humanus.
(2) Typus bovinus.
(3) Avian type.

In 1903 I published a paper, the gist of which was that human and bovine tuberculosis were separate and distinct infections, producing a different set of symptoms in the human body, and that they were probably antagonistic to each other.

The *human* type produces the greatest and most serious amount of tuberculosis in the form of pulmonary disease, popularly called consumption; it also causes tuberculous laryngitis, secondary intestinal ulceration, and, in some cases, lupus.

The *bovine* type of bacillus is introduced into the body through the alimentary tract in the form of infected milk, cheese, butter and dairy products, the infection usually being in very early life.

The *avian* type affects chickens and birds, which, in their turn, affect pigs in large numbers. This type is not pathogenic to man, and so we may disregard it.

A child affected with bovine bacilli may develop tuberculous glands, usually in the neck, mesenteric disease, affections of bones and joints, meningitis and lupus. Fortunately, these bovine lesions, if treated in the early stages, tend to natural cure, and do not seriously affect the general health afterwards.

The important point I wish to make is that these bovine affections undoubtedly confer an immunity against the more serious lesions caused by the human type, and in my experience a child who has recovered from glands and other bovine lesions is not so susceptible to pulmonary tuberculosis, and *vice versa*.

The two infections will not live in the human body at the same time. It is on this principle that I advocate the production of an active immunity in the prevention and treatment of the disease.

It has generally been held by pathologists that before a person can be considered immune to an infectious disease, he must be able to resist a virulent dose of the living organisms of the disease itself. This may be true in the laboratory, but it does not apply in practice. It is not necessary to produce *complete* immunity, as a *partial* active immunity is all that is necessary in the treatment and prevention of an infection in its early stages. We have a good example of this in anti-typhoid inoculation and in anti-tetanic serum, the wonderful effects of which I observed in the War. The immunity conferred was sufficient to deal with an early infection, and so prevent its spread and development in the body. It is not necessary either to use living cultures, as killed cultures of typhoid and para-typhoid are quite adequate and successful. In most of the acute infectious diseases, one attack confers an immunity to the patients for the rest of his life. This is not so in dealing with tuberculosis.

A person who has had pulmonary tuberculosis is always liable to a recurrence, even twenty years after a complete arrest. This is not observed to the same extent in cases of bovine lesions, and patients who have recovered from glands, bone and joint lesions rarely have a recurrence and often live to old age. It is for this reason that in attempting to produce an active immunity, we must use a vaccine prepared from killed cultures of the opposite strain.

For example, a case of pulmonary tuberculosis which is of the human type must be treated with a vaccine prepared from bovine bacilli, and *vice versa*.

Professor Calmette always uses a living bovine culture which has been attenuated to the extent of making the bacilli non-pathogenic. I personally never use living cultures, being quite satisfied in my results with killed bacilli.

Preparation of Vaccine.

The vaccine is prepared from cultures which have been continuously subcultured on glycerine-agar medium every month in my laboratory for the last 22 years. The present cultures are of the 262nd generation. This long process has deprived the cultures of their virulence and they are now so attenuated as to be quite non-pathogenic and non-tuberculigenic to animals. The cultures are all sterilized by heat before the vaccine is made. Being deprived of its virulence and toxicity, the vaccine produces no reactions, and can be given in much larger doses and with perfect safety.

Immunity.

With the object of preventing tuberculosis in dairy cows and thereby reducing the surgical tuberculosis in children caused by infected milk, I have been engaged during the last five years in immunizing calves shortly after birth, by giving them two injections of vaccine from human bacilli. The first one week after birth, and the second one week later. This has been done by competent veterinary surgeons, and we have records of over 2,200 calves. The results are excellent, and the immunity is at least over two years and probably longer. I look forward with great confidence to this method of attack, as, in my opinion, if we can eradicate the disease from dairy cows, we will to a great extent eliminate surgical tuberculosis from children.

Treatment of Early Cases.

From a very large experience in the treatment of patients suffering from tuberculosis in its varying stages, I have used tuberculin in over 2,000 hospital cases. I attribute the generally unfavourable results to the fact that the tuberculin was obtained from virulent cultures of human bacilli. The reactions produced in some cases were disturbing, and probably due to overdosage. This is entirely obviated by using attenuated bovine cultures, which never produce reactions if given in correct and graduated doses.

In early infections, the vaccine seems to produce sufficient active immunity to enable the tissues to produce sufficient anti-body to deal with the infection, and, what is of greater importance, to limit the spread of disease in the organ affected. During the last five years I have very carefully observed several cases in hospital in which the lesion was confined to one apex of the lung, bacilli being present in the sputum in every case. In most of the cases the disease has remained localized and arrested, showing no tendency to progress, a course of twelve injections being given every six months. I hope to report the final results of these selected cases in *The Practitioner* at a later date. The protection of the community by some safe scientific method of active immunization is the only effective way in which this preventable scourge can be eradicated.

The medical profession has, during the last few years, been losing their confidence in the specific treatment of tuberculosis by the various preparations of tuberculin. This can be accounted for by the fact that many of the tuberculins were prepared from virulent cultures which caused serious reactions and undoubtedly irritated the focus of infection. In my own experience it is not necessary to produce a reaction in the form of high temperature to achieve immunity. The vaccine should be prepared from cultures which have been deprived of their virulence and toxicity, and prepared from the opposite strains of tubercle bacilli. A case of pulmonary tuberculosis should be treated by a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Cost and Value

Throughout the three years during which it has been practised Caprokol therapy has proved itself consistently to be the most successful form of treatment for urinary infections, and many instances are recorded where it has cleared up an obstinate case which has resisted for years all other forms of treatment.

Therapy of such a nature, acting in some cases with amazing rapidity in the restoration of ease and comfort—and always with definite efficacy ultimately—is not comparable in regard to the actual *price per dose* with treatment with any ordinary drug; indeed, to the patient who has suffered inconvenience and has undergone, without appreciable benefit, the usual routine treatment over an extended period, the *value* of Caprokol therapy is inestimable. Moreover, even in a case which may have been treated successfully by routine methods, the cost of the complete course, by reason of its length, exceeds that of the treatment of a similar case with Caprokol.

The object in making this statement is to remove any false impression which may be created when comparison is made of the *cost per dose* of ordinary urinary antiseptics with that of

CAPROKOL

The Urinary Antiseptic

Descriptive literature will be sent on request to the B.D.H. representatives resident in India :—

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Bldgs.,
Parsee Bazar Street,
Fort, BOMBAY.

THE BRITISH DRUG HOUSES LIMITED
LONDON

Ca/In/294.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

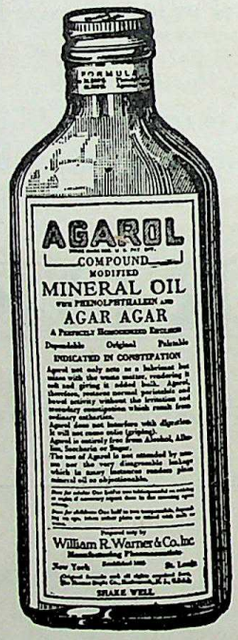
Digitized by Arya Samaj Foundation Chennai and eGangotri

The Natural Habitus of Regular Bowel Action

is seldom restored by ordinary laxatives. But the effects of Agarol are not those of ordinary laxatives. To be sure, it will clear out the bowel thoroughly and well, without griping or distress, and often afford prompt relief when other measures have failed. It is when it is employed regularly for a reasonable period that Agarol demonstrates it superiority. For example, of 400 cases of all forms of constipation treated in a hospital, not only were the results uniformly satisfactory but a *large percentage had the natural activity of their bowels re-established in two to four weeks.*

Agarol enables the physician to treat chronic constipation with new-born confidence.

AGAROL the *original* Mineral Oil—Agar-Agar Emulsion, has these special advantages: Perfect emulsification; stability; pleasant taste without artificial flavouring.



Freedom from sugar, alkalies and alcohol; no contra-indications; no oil leakage.

No griping or pain; no nausea or gastric disturbances; not habit forming.

AGAROL

Prepared by

WILLIAM R. WARNER & CO., INC.,

Manufacturing Pharmaceutists Since 1856.

113-123, WEST 18th STREET NEW YORK CITY

Agents in India:—Martin & Harris, 8, Waterloo Street, Calcutta; 119, Parsi Bazar Street, Fort, Bombay; and 20, Sunkurama Chetty Street, Madras.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

vaccine prepared from bovine bacilli, and a case of surgical tuberculosis by a vaccine prepared from human bacilli. The dosage should be carefully graduated, and a course for treatment should consist of twelve weekly injections, the maximum dose being 0.01 mg. In no case are any reactions produced.

Reviews.

STUDIES ON MALARIA.—By Sir Ronald Ross, K.C.B., K.C.M.G., F.R.S., F.R.C.S., Colonel, T.A. (Retd.), Major, I.M.S. (Retd.). London: John Murray, 1928. Pp. xi plus 196. Price, 5s. net.

As stated on the wrapper, "this book gives in a small compass all the essentials of the author's work on malaria from 1895 to the present time." Unfortunately, it also leaves out all the romantic details of the years 1897-1899, when the problem was finally solved. Anyone who wishes to follow the details of the research, the trials, the errors, the disappointments and official frustrations, through to the final crowning success, must search for such in the author's earlier *Memoirs*, of which the present work is really only a cheaper, abridged edition. Those who are particularly interested in malaria will naturally possess the larger work, those whose interest is less acute, or who merely wish to know how the thing was done, will, it is feared, turn from the present work with very little comprehension of how the discovery was really made, or of what it consisted.

Inevitably, after the actual account of the discovery, there follows the author's version of his controversy with the Italians over the question of priority. Long since settled in the author's favour, twenty-three out of one hundred and seventy-seven pages are devoted to an account of it from which no unprejudiced reader, or one approaching the subject for the first time, could possibly form a judgment, as, unlike the *Memoirs*, the text of the documents on either side is not quoted to any appreciable extent. Interspersed, however, with the actual account, are certain criticisms of Prof. Grassi's work which appear untenable. On page 22, Grassi's method of attempting to incriminate the carrier by "comparing the frequency of the different species in malarious and non-malarious areas" is stated to be one "which no sound scientific worker would have employed." We would ask why? It was admittedly not Ross' method, which would in any case have to have been used for the final proof, but it certainly served to "get a line" on the carrier. It is the method, moreover, by which suspicion was finally fastened on the sand-fly in the transmission of kala-azar. On page 24 the author doubts the possibility of new evidence coming to light in twenty-four hours. We would remind him that it was his dissection findings of 20th August, 1897, not before, not after, which will rank ultimately as a red-letter day in the history of the world. On page 39 he stigmatizes the Italians' first cultivation of quartan and benign tertian as "lucky experiments." This tallies ill with the "Angel of Fate" which led his own mosquito coolies, after unwittingly misleading him for years with Culicine mosquitoes to bring him Anopheles larvæ for the first time five days before his great date. Again, the fact that at Sierra Leone, a year later (page 43), the author discovered zygotes in one out of five *A. funestus* dissected on 13th August, will be held by everyone who has done dissections for parasites as surely a stroke of luck as anything that could have happened to the Italians.

On page 62, Giles' *Gnats or Mosquitoes* is unfavourably compared with Theobald's *Monograph*. Anyone who has had much to do with the systematics of the subject will surely ask why? On page 66, Manson's experiment in bringing infected mosquitoes from the Campagna and by them causing infection in London is animadverted on. Again, why? It is as capable of repetition as any experiment of Ross', is far more spectacular, and was designed to convince a generally sceptical profession, not a few expert parasitologists.

On page 76, the author comments on a letter in the *Indian Medical Gazette* from Capt. S. P. James, concerning anophelines in rice-fields in Travancore. The same incident is referred to on page 427 of the *Memoirs*. In neither case is the text, or any part thereof of James' letter quoted. It seems useful to exhume this letter, which appears to have adversely affected the course of malaria prevention in India, from the files of the *Indian Medical Gazette*, as it apparently contains the earliest views of one who is now one of the foremost malariologists of the World.

"*To the Editor of* 'THE INDIAN MEDICAL GAZETTE.'

SIR,—It is, I believe, generally considered that the breeding grounds of the malaria-carrying species of mosquito (viz., those with spotted wings) are few and far between. Major Ross has written with regard to the practicability of exterminating this variety of mosquito: 'The breeding grounds of the spotted-winged varieties seem to be so small and isolated that I think it may be possible to exterminate this species under certain circumstances.' He further states that in the cantonment of Secunderabad he was able to find the larvæ of spotted-winged mosquitoes only after a long search, in a single little pool which could be filled up with a few cartloads of town rubbish.

It would be fortunate if this were the case in all places where malaria is prevalent, but it is an important, though—from the point of view of their extermination—an unpleasant fact that in some places in India where malaria is exceedingly rife this 'dangerous' species of mosquito chooses for its breeding ground rice-fields near habitations, and large areas of water which from their nature are difficult to drain or remove. Such at least is the case in parts of Travancore.

On first coming to Quilon I searched for the spotted-winged varieties of mosquitoes in out-of-the-way pools and stagnant puddles of rain water away from habitations, neglecting the rice-fields which surround my bungalow on every side. For many weeks I was not able to obtain any of their larvæ and was the more surprised at this, as I was frequently able to catch spotted-winged mosquitoes in my bungalow, which had settled themselves on the curtains and clothes hanging up in the rooms. After many fruitless searches in every pool near the cantonment, I at last turned to the rice-fields round the bungalow, which were then covered for the most part with water to a depth of three or four inches; and here I found the larvæ of the spotted-winged varieties of mosquito in profusion. Since then from these rice-fields and from other large areas of water in the cantonment I have frequently been able to obtain a supply of these mosquitoes when none could be got from any pool or small collection of water near.

This circumstance, that apparently in many parts of the country where malaria is most prevalent the 'dangerous' varieties of mosquitoes are found to breed in rice-fields and other large areas of water, must add considerably to the task of exterminating them from such localities, should such at any time be attempted.—Yours faithfully,

S. P. JAMES, CAPT., I.M.S.,
19th Regt. M. I., Quilon, S. India.

QUILON,
TRAVANCORE,
27th September, 1899."

As the letter stands, it is easy to comprehend how Capt. James' finding may have been seized upon by opponents to discredit the possibility of malaria control by mosquito eradication. At this period nothing was known specifically of the Indian anophelines, only *barbirostris* and *sinensis* had been described, neither of them from India, though of course they existed there. The second paragraph of the letter shows that the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

writer was under the apprehension that there was only one species of "spotted-winged mosquito," unlike Ross, who had already distinguished two, the "brown," (? *stephensi*) and the "small" (? *culicifacies*). Ross had found that both his species carried malaria, therefore James must have imagined that every "spotted-winged" species could do so. Ross and Daniels had yet to encounter the "crux" of the non-carrying *rossi* in Calcutta, and work on the carrying capacity of individual species was yet in the womb of futurity, necessarily awaiting delivery by the systematic entomologists, of whom James himself was later to become one of the pioneers in the group. It is easy, at this distance, to criticize, but assuming James' familiarity with Ross' technique, he could have checked for himself whether the abundant rice-field anophelines that invaded his bungalow were carrying or not, which he does not seem to have attempted before writing his letter, and could thus have avoided giving a handle to opponents in high places, as well as making a discovery of first class importance, viz., that under certain circumstances "the soptted-winged species" did not carry, or, granted the beginning of the systematically discriminative eye that he later came to possess, that there were more than one species of them, for in rice-fields he must have encountered the *fuliginosus* group with their very noticeable white hind tarsi, the *sinensis* group with their quite different wing pattern and general facies, as well as, perhaps, the black-legged *myzomyias* with four costal spots familiar to Ross. Moreover, even so early, a line might have been got on what is still the greatest unsolved aspect of the Indian malaria problem, its connection, or otherwise, with rice-fields, some of which, we now know, under certain circumstances to be malariferous, though the generality of such are not. *Vis-à-vis* rice-fields, our present methods of control, Paris green notwithstanding, fail, and until we can deal with rice-field malaria, where it exists, we are not in a position to afford much help to the countless Indian villages, and, as the reviewer has pointed out in a previous article, also reviewing a paper of Sir Ronald's, the benefits of malaria control are only enjoyed, or enjoyable, by Indians in the employ of capitalistic undertakings.

We can thoroughly sympathise with Sir Ronald over the incident recorded on page 106. In his case influenza, in our own bronchitis, has been misconstrued into malaria by persons anxious to disparage our work, though why there should be anything more for adverse comment in a malariologist's contracting the disease he is investigating than in a soldier in the front line getting wounded, we fail to comprehend!

The account of the Jenner Institute incident given in the present volume is even less clear than that given in the *Memoirs*, and we consider that unless the author is prepared to amplify the story, and quote Lord Lister's letter (which he evidently is not), the matter should have been left in oblivion. Surely anyone is entitled to change a post for a better one without other than financial reasons.

On page 134, the author strikes at the root of the whole trouble of the average malariologist, he is "only invited to advise, not to manage the work." How many of us have again and again conducted surveys and produced schemes, only to see them pigeon-holed, whilst the disease, the sickness and the loss continue. And one is then asked "what are you *doing*"?

On pages 151 and 152, the author refers to a most contentious article from his pen which has appeared even later than the book under review. An article which, if not controverted, may lead to results which we are certain he did not foresee, or desire. May we refer him back from page 152 to pages 12, 77, 116, and on to pages 164 and 171, of his volume? In the third reference we find him carrying out, in respect of his most successful practical campaign, the identical procedure for which he has in this article just held up his professional disciples to ridicule.

In chapter XX, the author deals with a subject which is barely mentioned in the *Memoirs*, and which he styles "Pathometry." We may not agree with all he says in this chapter, notably his assumption that malaria has died out in England through reduction in the actual number of malaria-carrying Anophelines there, whilst we find it his excuse that England did not provide with material for improving his "conjectural constants" weak,—certain of them could assuredly have been experimentally evaluated as well, or even better, at home than in the tropics,—but we do consider that his energies would have been far more usefully devoted to collecting and collating his scattered papers on this subject into a "single small volume" than to producing the réchauffé which forms the subject of the present review. As a master of mathematics as well as malariology, he is fitted to deal with this vitally important matter in a way that few other malariologists are, and we would conclude by expressing the hope that Sir Ronald may be spared to give us in connected form the results of his investigations on this subject, results which we of the next generation can make use of in our daily struggle to continue his great work.

R. S. W.

UNE GRANDE PAGE DE L'HISTOIRE DE LA ME'DICINE: LA DECOUVERTE DE LA TRANSMISSION DU PALUDISME PAR LES MOUSTIQUES. —By Sir Ronald Ross, K.C.B., K.C.M.G., F.R.S., etc., preface and translation by Dr. Charles Broquet. Paris: Norbert Maloine. 1929. Pp. 173, with 9 plates and 7 figures. Price, 20 Francs.

THIS is the French translation of the author's Nobel Prize lecture of 1902, and we would at once say that it is by far the clearest and most interesting of the three accounts of his discovery published by Sir Ronald. Why, at a time when the original English article [*R. A. M. C. Journal*, April—June, 1905] was being reprinted in translation to form the present work, the author troubled to produce the condensation of his *Memoirs* which we reviewed above, passes our comprehension, for in the present work we have the whole research set forth with complete clarity, and can appreciate, as not even the *Memoirs* cause us to do, the various steps. From the restrained, though graphic eloquence of the translator's preface to the invaluable reproductions of the plates from the now unobtainable "Report on the Culture of *Proteosoma*, Labbe, in grey mosquitoes," and from figures in the articles in the *British Medical Journal* of 1897 and 1898, by Ross and Manson, the whole work has not a dull or unnecessary line. We are spared the tirades against the Italians, and have the case against them set forth briefly but succinctly. Of works easily obtainable, it is indubitably the most valuable account in existence.

There is little in the actual account that calls for comment, but we had not hitherto appreciated properly that the hypotheses of King and of Manson, taken conjointly, represented the actual truth, and that no one had done so is, we agree, "assez curieux," (p. 45). On page 64, we find the author himself pursuing, at Sigur Ghat, the epidemiological method for which he has blamed the Italians in his recent *Studies*, on which the reviewer passed detailed criticism in dealing with that work.

Of erroneous beliefs of the past there are a few still quoted, noticeably on pages 45 and 98, in connection with the life histories of *Piroplasma* and *Trypanosoma*, which might have been indicated by later-dated footnotes. The explanation of plate I does not indicate that figure 20 is that of "black spores," and not of a normal zygote of the sixth day. The date of the opening of the Calcutta Memorial Gate should be 7th January, not 17th. But these are minor blemishes. Far more serious is the very poor binding of the book. It is in paper covers, and our copy is already nearly disintegrated into individual leaves as the result of one through reading.

We as Britishers may very well feel proud that our French neighbours have sufficiently valued Sir Ronald's

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MEDICAL EVIDENCE

"All experience goes to show that Virol is a food of marked value in a great variety of conditions in which adequate nutrition by ordinary means is not easy to secure, including the general range of disease accompanied by wasting and Summer Diarrhœa."

British Medical Journal.

Virol is composed of marrow fat, glycerine extract of red bone marrow, eggs, salts of lime, iron, etc., malt extract, and the juice of fresh lemons blended in balanced proportion into an exceedingly fine and palatable emulsion, and prepared in such a manner as to retain unaltered the vital constituents of each of its components.

"The administration of Bone-Marrow in the form of Virol is attended by a distinct and progressive increase in the phagocytic power of the Leucocytes when tested against the Tubercle Bacillus due to a corresponding increase of opsonins in the sera examined. During the last eighteen months Virol has been used at the Sanatorium as a routine article of diet in all stages of Scarlet Fever and Diphtheria, during which period there has been a marked diminution of complications."

Medical Superintendent,
Monsall Fever Hospital,
MANCHESTER.

Virol has moreover a marked effect upon the conservation of the tissues, repairing waste, and restoring the equilibrium of a healthy metabolism. Its unequalled value as a repairer of tissue waste is of the utmost importance in bringing about a sound convalescence.

The addition of Virol to the diet is specially indicated in

ANÆMIA,
TUBERCULOSIS, FEVERS
and
GASTRIC DISORDERS.

VIROL

VIROL LIMITED, HANGER LANE, EALING, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

INFANT FEEDING ON SCIENTIFIC LINES

WHEN artificial feeding has to be adopted, either entirely or in part, the "Allenburys" Progressive System of Infant Feeding fully meets the case. The "Allenburys" Series of Foods is arranged on a true physiological basis; it provides a progressive dietary suited to the development of the infant, supplying at the appropriate times the stimuli that call forth, in a natural way, the secretion of the digestive enzymes.

The "ALLENBURYS" MILK FOOD No. 1 is adapted to the first three months of life. It is a scientifically balanced nutrient which when prepared for use, is similar to human milk in composition, physical properties and ready digestibility. *It contains no starch.*

The "ALLENBURYS" MILK FOOD No. 2 is used from the beginning of the fourth month to the end of the sixth month. It is similar to the No. 1 Food except that it contains a proportion of the soluble phosphates, albuminoids and sugars obtained by the digestive action of malt on whole wheat. *It contains no starch.*

The "ALLENBURYS" MALTED FOOD No. 3 is for use from the beginning of the seventh month. It consists of a carefully selected wheaten flour of a high albuminoid content. so treated as to render it easy of digestion, together with a proportion of the diastasic and nutritive constituents of malt. When prepared for use it contains no unaltered starch.

The "ALLENBURYS" MALTED RUSKS are made from special flours rich in protein and provide the infant's first solid food. As early as the fifth month these rusks may be used, a little at a time, to aid the cutting of the teeth. From about the tenth month they may be given as a staple article of diet in conjunction with the Malted Food No. 3.

The "Allenburys" Foods are designed particularly for Infant Feeding and are manufactured by special processes which make them peculiarly suited for this purpose. They are constant in composition and free from any pathogenic organisms.

A copy of our new publication "The 'Allenburys' Foods in Infant Feeding" will be sent post free on request.

ALLEN & HANBURYS LTD.
LONDON.

Special Representative for India:
A. H. P. JENNINGS, Block E, Clive Buildings, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

work to publish, in a Medical Series, a detailed account of the discovery in their own language. Should any French admirer of Sir Ronald's work, however, come to Calcutta and visit the Ross Memorial Gate, he would be astonished at the dirty condition into which it has been allowed to pass. If, as a nation, we value our great investigators below the architectural magnificence which the French have risen to in the Pasteur Chapel, we can at least keep our less ambitious efforts in a reasonable state of preservation, the more so when their care devolves on members of the same great profession and service of which Sir Ronald is one of the first-magnitude luminaries.

R. S. W.

Note.—Since this was written, the Gate has been cleaned. We are sure that its present condition would entirely satisfy our reviewer.—ED., *I. M. G.*

Annual Reports.

REPORT ON THE JAIL ADMINISTRATION OF THE PROVINCE OF ASSAM FOR THE YEAR 1927. BY COL. G. HUTCHESON, M.B., I.M.S., INSPECTOR-GENERAL OF PRISONS, ASSAM. PRINTED AT THE ASSAM SECRETARIAT PRINTING OFFICE, 1928. PRICE, Rs. 3-5.

Number of Jails.—There was no change in the number of jails and sub-jails during the year under report. The lock-ups at Hailakandi and Barpeta reverted to their former status as Magistrates' lock-ups from 1st September, 1927, and were no longer under the control of the Inspector-General of Prisons from that date.

Fluctuations in jail population (General Summary).—The year opened with a population of 2,331 prisoners of all classes against 2,257 in the previous year. The number of admissions increased by 1,000 and that of discharges by 1,047. The year closed with a population of 2,358 prisoners in jail, against 2,331 in 1926.

Number and disposal of convicts and proportion of the same to total population. (Statement No. I).—The year commenced with 1,928 convicts in confinement, of whom 1,905 were males and 23 females. The number imprisoned during the year was 3,597 males and 62 females against 3,240 males and 67 females in 1926. The total number of convicts dealt with during the year, including transfers from other jails both in and out of the province, was 7,357 against 6,719.

Distribution of convicts according to (a) Religion. (Statement No. II).—Of the total number of convicts admitted during the year 0.27 per cent. were Christians, 42.09 per cent. Muhammadans, 52.75 per cent. Hindus and Sikhs, .08 per cent. Buddhists and Jains and 4.81 per cent. all other classes.

Escapes. (Statement V).—As in the previous year, there were only 3 escapes against 7 in 1925. Of these two occurred at Silchar and one at Jorhat, all from outside the jails.

The total strength of permanent warders was 290, including 3 female warders at Sylhet, Gauhati and Tezpur, and 8 additional warders sanctioned during the year for the 4 sub-jails at Habiganj, Sunamganj, Karimganj and South-Sylhet.

In comparison with former years, the general health and mortality may be considered to have been very satisfactory.

The years 1924 and 1926, show the best records of the past ten years, and the figures for 1927 compare very favourably with them. Though the daily average population in 1927 was somewhat higher, the number of admissions to hospital and ratio per mille of admissions are lower than in 1924, and only slightly in excess of 1926. The daily average sick 75.86 shows a slight increase over 74.29 in the previous year, while the ratio per mille was lower 31.32 against 31.02 in 1926.

The number of deaths in 1927 were 50, with a ratio per mille of 20.64, against 46 and 19.51, and 47 and 20.26 in 1924 and 1926, respectively, in which years the mortality was the lowest in the decennium. Sylhet alone showed 29 deaths, against 10 in 1924 and 18 in 1926, otherwise the record for the year would have been particularly good.

The ratio of deaths per mille was 20.64 in the jails of the province against the provincial death rate of 23.47.

The percentages of prisoners admitted in good, indifferent and bad health were 47, 45 and 8 against 51, 42 and 7, respectively, in the previous year. In the Assam Valley jails 32.58 per cent. were habitual drug-takers and in the Surma Valley 2.59 per cent.

There were no deaths in the district jails at Nowgong, Shillong, Kohima and Aijal or in the sub-jails at Sunamganj, Habiganj, South-Sylhet, Mangaldai, Sibsagar, Golaghat and North Lakhimpur.

Sylhet.—This jail again shows an unfortunate mortality record. There were 29 deaths, all among convicts, with a ratio of 43.03 (district death rate being 26.21) against 18 and 25.08 in 1926, and 11 and 18.93 in 1925. The causes of death were pulmonary tuberculosis (10), tuberculosis of kidney (2), ankylostoma (2), pneumonia (2), enteritis (2), gastric ulcer (2), and enteric fever, leprosy, melancholia, meningeal hæmorrhage, thrombosis, meningitis, hepatic disease, malaria and scald, one each. Of these 29 convicts who died, 7 were admitted to jail in bad health, 15 in indifferent and 7 in good health. Twelve deaths occurred in November and December, and 6 of these were due to tubercular diseases. Eight deaths occurred within 4 months of admissions to jail, 3 being cases of tubercle. The 2 cases of ankylostoma were admitted to jail with general anasarca. Two cases died within 22 days of transfer from the Habiganj Sub-Jail.

The rise in the number of both admissions and deaths under tubercular diseases is remarkable and is difficult to explain. In this connection it is interesting to note that the number of patients treated for these diseases at the Sylhet Sadr Hospital rose from 76 in 1926 to 110 in 1927. The percentage of prisoners admitted in good health fell from 58.17 in 1925 to 50.28 in 1926 and to 45.14 in 1927.

The daily average sick rate fell from 32.01 in 1926 to 30.37, and the total number of admissions to hospital from 534 to 430.

For dysentery there were 26 admissions with no death in 1927 against 57 and 4 in the previous year.

Malaria showed a very marked decline from 73 admissions and 2 deaths in 1926 to 20 and 1 death in 1927.

Admissions for diarrhœa showed a very satisfactory fall from 69 to 8.

An epidemic of influenza occurred in July: there were 144 cases with no death.

The Sylhet Jail has the best hospital in the province and a competent medical staff. There has been no overcrowding in barracks and Lieut.-Colonel McCoy, assisted by his very experienced and reliable jailer and staff, has paid the minutest attention to every detail of the administration.

Jorhat.—There were 7 deaths with a ratio of 27.66 against 3 deaths and a ratio of 14.60 in the previous year. The deaths were due to tubercle of lungs (2), pneumonia (2), dysentery (2) and *kala-azar* (1). Two of these cases were admitted to jail in bad and 3 in indifferent health. One case of dysentery and one of advanced *kala-azar* were seriously ill on admission and remained in hospital till they died shortly after.

Gauhati.—Showed 4 deaths with a death rate of 10.26 which appears to be the lowest figure ever recorded in this jail. The Tezpur figures, viz., 3 deaths with a death rate of 9.22 are also extremely satisfactory and by far the lowest in the last ten years. The 2 deaths at Dibrugarh were due to causes outside the jail control, one patient being admitted suffering from

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

old standing tuberculosis and the other from enteric fever. At Dhubri there was 1 death from *kala-azar* against 4 in the previous year while Silchar showed one death from enteritis.

Subsidiary jails.—There were 3 deaths with a ratio of 10.10 against 1 death with a ratio of 3.58 per mille in the previous year.

The 2 deaths at Tura were due to dysentery and the one at Karimganj to chronic nephritis.

Sickness and mortality among convicts. (*Statement XIV*).—The daily average number of convicted prisoners for the year was 2,012.72 against 1,929.32. The number admitted to hospital was 1,165 giving a daily average sick rate of 67.75 against 1,115 and 65.73 in the previous year. All of the 50 deaths were among this class of prisoners.

Repatriated Andamans prisoners.—Three prisoners were received from the Andamans; one was received in a very bad state of health and died within a fortnight of his arrival. The health of the others is gradually improving.

The jails are experiencing considerable difficulty in the matter of suitable and profitable industries, and in finding a market for their manufactures. Attempts have been made to compete with the outside market for orders for tea baskets, etc., used in tea gardens and railways, but without success. The question of revising the system of fixing the value of jail-made goods is under consideration, and it will probably be necessary to reduce the percentage of profit. Far more assistance could be obtained from Government Departments if they placed orders with the jails for their requirements.

Arrangements are now being made for special classes for the training of prisoners in carpentry, smithy and masonry at the Sylhet and Gauhati Jails. This will teach trades which will be useful to prisoners on release, and will enable jails to undertake departmental works without employing outside labour.

Religious instructors.—Both Hindu and Muhammadan religious instructors were appointed for the jails at Silchar, Sylhet, Gauhati, Tezpur, Jorhat and Dibrugarh.

Discharged prisoners' aid societies.—There has been no response to the appeals made by Government in previous years to public-spirited persons to come forward to organise such societies.

Lunatics.—The same difficulties have been experienced as in previous years, but will disappear when the new Mental Hospital is completed. At Dibrugarh the number of lunatics has been usually 20 or more and they have been accommodated in the *hajat* ward.

Buildings.—The reconstruction of the Tezpur Jail commenced during the year and is making good progress. Major works completed or nearly completed include two worksheds at Sylhet, a workshed at Jorhat, a wall round the Aijal Jail, and extension of the barrack and reconstruction of the workshed at Habiganj.

General.—Though there was an increase in population, the number of jail offences and of punishments was less than in 1926; the number of offences under "assaults and escapes" fell from 56 to 10, no corporal punishment was inflicted, and there were only 5 escapes (3 convicts and 2 undertrials), which is the same as in 1924 and the lowest figure for many years. The average remission earned by prisoners in days, and the number released under remission rules, increased, while the number who gained remission for special services rose from 171 in 1925 to 272 in 1926 and 339 in 1927. From these remarks it is evident that discipline has been well maintained.

With regard to health and in spite of the unfortunate record of Sylhet, the year under report compares very favourably with the best years 1924 and 1926 of the decennium.

Lieut.-Colonel H. Innes, I.M.S., was in charge of the Department from the 1st to the 31st January and Colonel G. Hutcheson, I.M.S., from the 1st February to the end of the year.

REPORT ON THE WORKING OF THE MENTAL HOSPITALS IN BURMA FOR THE YEAR 1927, BY COLONEL W. H. C. FORSTER, I.M.S., INSPECTOR-GENERAL OF CIVIL HOSPITALS, BURMA. SUPERINTENDENT, GOVERNMENT PRINTING AND STATIONERY, BURMA. PRICE, RE. 1-8.

THE main features of the Burma Mental Hospitals report for 1927, are as follows:—

Accommodation.—The accommodation at the Mental Hospitals was for 1,821 (males 1,409, females 274) in Rangoon and males 138 at Minbu. There is accommodation for 275 sick in Rangoon (males 202, females 73) and this includes eight beds for males and eight for females for tubercular cases and 24 (12 males and 12 females) cells in which dysentery patients can be segregated.

At Tadagale, there is a contagious diseases ward which will accommodate eight patients. There was nowhere any overcrowding; but the five cells (brick walled and with cement flooring) for dangerous and noisy lunatics should be padded.

Population.—The population at St. John's Road Hospital, Rangoon, at the beginning of the year was 687 (549 males, 138 females).

At Tadagale, 186 males were accommodated.

The highest number confined on any single occasion was: Rangoon 624 (486 males, 138 females); Tadagale 324 males; Minbu 131 males.

The total average at the two Rangoon Hospitals was 922.80 (784.89 males, 137.91 females). At Minbu the average population was 129.75. During the year, 138 patients were transferred to Tadagale from Rangoon.

Admission.—There were 276 admissions during the year (this includes 19 re-admissions), 245 males, 31 females.

One hundred and thirty-four patients (113 males, 21 females) were discharged; of these 88 were reported cured; 33 improved; 13 otherwise.

In 1925, the number discharged cured was 80, in 1926, 71, and 1927, 88. Discharged improved were 28 in 1925; 30 in 1926; 33 in 1927. Friends or relatives will not come forward to accept the risk and trouble that is involved in caring for mental patients in their own homes.

Minbu Hospital admitted six observation cases, four were found to be insane, two were discharged.

Forty-seven per cent. of all admissions are from Rangoon and are usually of the cultivator class.

Seventy-five per cent. of all admitted are between 20 and 40 years of age.

During the year, 276 insanes were admitted to Rangoon Hospital—13 were due to hereditary predisposition, 37 had had previous attacks, 4 were in addition blind, 2 were cases of puerperal insanity and 19 were associated with a sudden mental stress, such as loss of property or near relations, 37 were associated with excessive indulgence in alcohol, whether as a cause or an associated symptom is not stated. In many of these cases, alcohol is probably the exciting cause, in otherwise predisposed subjects. Twenty-three were drug addicts. Opium, cocaine and cannabis indica are all noted as associated factors. Acquired syphilis is responsible for 10 male patients, the disease acting as an exciting cause resulting in impaired health and vascular degeneration. No ascertainable cause is assigned for 32 male patients; the information obtainable is scanty in most cases, but in certain cases nothing at all is known about past habits or family history. Considering the remarkable prevalence of venereal diseases in Rangoon, the proportion of cases of neuro-syphilis which results in mental failure is small, this is to be anticipated in a population largely engaged in manual labour. There were 32 cases of epilepsy, the pathology of which is unknown. There were 45 imbeciles, the imbecility probably due to congenital mental deficiency. Mania in a recurrent form greatly outweighs melancholia, but 45 cases of mania are shown as recovered sufficiently to enable them to be discharged. Eleven cases of mania and 7 of melancholia are associated

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Glaxo

is a practically sterile powder in which bacteria cannot multiply: it differs therefore from *all* liquid forms of milk—whether concentrated or not—because in them bacterial multiplication takes place as soon as they are exposed to the air—a vital defect in food for infants

THE reasons given publicly by an eminent authority for his belief that dried milk is the best solution of the milk problem, are, in his words:

"(1) *It will keep for some months:* (2) *it is easy to manipulate in the home:* (3) *there is little or no souring:*

LITERATURE AND INFORMATION GLADLY SENT ON REQUEST TO;

H. J. Foster & Co. Ltd., P.O. Box 202, Bombay

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LOW BLOOD CALCIUM

"An investigation of the means whereby the body renews itself and antagonises the toxaemias, discloses a phase of mineral metabolism represented by a continual struggle between acids and alkalies. Acidity spells death—alkalinity life."
"Practical Organotherapy, Harrower," 1922.

TOXÆMIAS tend to cause acidosis, and the natural chemical result is the neutralization of at least a part of the body's store of alkalies.

PARATHYROID THERAPY

INCREASES THE BLOOD CALCIUM

BY ACTUAL TEST

STANDARDISED PARATHYROID

PARACALCIN (Harrower) is standardised according to its influence on the blood calcium, e.g., 5 c.c. (or 100 units) will produce an increase of 5 mg. in the blood calcium of a 20 kg. dog in 15 hours.

PARACALCIN, which is the first definitely standardised parathyroid in tablet form, is put up in tablets containing gr. 1|10 of true parathyroid, 1 tablet being equivalent to 1 unit. In vials of 15 tablets.

PARACALCIN SOLUTION is available in ½ c.c. ampoules, each ampoule containing 10 units.

When employing PARACALCIN, you will know exactly what dose of true parathyroid your patient actually is receiving.

Another useful and time-tried combination is Tablets and Solution PARA-SPLEEN Co. (Harrower).

For Literature Address :

THE ENDOCRINES LABORATORY, SIMLA.

ENDOCRINES LIMITED,

Sole Distributors for The Harrower Laboratory.

And at 72, Wigmore Street, London, W.1. WATFORD, HERTS.

Telephones : Watford 1784 : Mayfair 3667.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

with old age. The admission of males is about 9 times that of females (271 males to 31 females). There are no doubt economic reasons for this. The actual proportion of male and female insanes to the general population is about equal, but as the men are more troublesome to look after they are sent to an asylum.

The general health was good. There was no epidemic during the year. There were, however, 77 cases of dysentery (72 of them men), of whom 8 died (elderly and infirm men). Eighty-nine per cent. of all cases recovered under treatment and careful nursing. All dysentery cases are segregated for two months after recovery.

There were 32 epileptics and 913 fits were observed and recorded, and 39 patients were artificially fed. All newly admitted cases were vaccinated. The whole population (including staff) were re-vaccinated during 1926. At Minbu, the general health was good throughout the year. There was no epidemic disease in the institution, though cholera and plague were prevalent outside in town and district.

There were 56 deaths (48 males and 8 females), and 9 cases for observation, brought in in a very weak state, died (7 males and 2 females); this compares with 57 deaths and 3 deaths (observation cases) in 1926.

The daily average sick was 42.20 in 1927; 29.08 in 1926; 77.70 in 1925. Percentage of deaths to average population 6.07 in 1927; 6.72 in 1926; 9.43 in 1925.

Dysentery, pulmonary tuberculosis, pneumonia, exhaustion from dementia and nephritis, accounted for most of the deaths.

Two deaths at Minbu were due to senility.

Escapes, Accidents, Suicides.—There were two escapes, one from Rangoon and one from Tadagale. The first was brought back from Shwebo by the Police after 18 days, and the second is still at large. The Eastern Subdivisional Magistrate held an enquiry into the cause of death in a demented case who died as the result of a chicken bone which lodged in his throat.

Sanitation.—The walls of all cells were scraped and treated with earth-oil. Wooden floors were treated with kerosine to dislodge bugs, where there was any reason to suspect their presence.

Tar and crude oil were issued for latrines. Jaggery fly lotion containing sodium arsenite was freely used to destroy flies and has been most effective.

Dustbins are used for rubbish, and these and the latrines are regularly conserved.

At Tadagale, a waterborne sewage system is in use, thence sewage is carried through filtration beds to a sewage farm.

At Minbu, a dry earth system is in use; clean dry sand is used and the material removed three times.

Gardens and Dairy are both self-supporting, the vegetables produced supplied all requirements in the asylums and fetched by sales to staff and public Rs. 15,384-0-4. The value of the vegetables issued to patients was Rs. 14,462-4-4 and of those sold Rs. 921.

The cattle cost more to feed this year, for a large number of calves too young to sell could not be got rid of. Receipts from cattle were Rs. 6,868 and expenditure Rs. 5,672.

Diets.—There was no general change in diet. Variety within the sanctioned scale of expenditure was aimed at. Milk, soup and eggs were issued as extras. On festival days, a special diet of *palaw* and fruits was issued. Raw and cooked rations were examined daily and passed by the Deputy Superintendent.

Amusement and Recreation.—A gramophone is supplied to each section; *pwès* are occasionally held, and a band plays once a month during the dry season at the cost of the Corporation of Rangoon. Annual sports were held this year and successful competitors were given small money prizes. A special diet is issued on all these occasions as well as on special religious festivals. Various journals and newspapers were circulated with beneficial results.

Certain patients go under escort to churches, pagodas and bioscopes, and a few visit friends. *Chinlon*, football and badminton are played every day.

U Nyaneinda visited the Minbu Hospital on Sundays and festival days and preached to those who listen to him.

Employment.—The daily average employed on work at the Rangoon Hospital was 370 (males 341, females 29), at Tadagale 112. Labour is, however, not compulsory. Those able to do so and refusing to work were made to walk morning and evening as exercise. Money rewards varying from annas 2 to Re. 1-4-0, depending on the nature of work done, are given to encourage a useful and healthy occupation. Sweeping, cleaning of compounds, weeding, and jungle-cutting occupy the majority. Others assist in bathing helpless and demented patients, in distributing food, in washing clothes and cooking. The men in addition do carpentry, paddy-grinding, water-carrying and look after the asylum cattle. In Minbu, the inmates are employed in gardening, weaving, tailoring, paddy-grinding. The work was enough to maintain them in good condition. There was a daily issue of tobacco.

Cases, on admission, go to observation cells and a thorough and careful examination follows. Artificial feeding is used only in the last resort, when every effort to induce the patient to take food fails. Paraldehyde, sulphonal and trional were the most generally used drugs for treatment. A few cases needed hyoscine injections, where excitement was extreme. Strict personal hygiene and a suitable occupation were the chief factors in treatment. Water for drinking, for washing and the gardens is derived from wells in both hospitals. At Tadagale, 2 tube wells out of 4 borings have been in use. One failed, the 12 inches casing pipe having broken 200 feet below the surface, hence water consumption was reduced as far as possible. The fourth boring proved a failure and the Superintendent reports that the third well is not likely ever to work.

Bedding.—The patients made all their own clothing as well as the uniform of female keepers and servants. The change into khaki uniform necessitated purchase of materials during the year. The bed sheets used by different sections were differently coloured to distinguish them. A distinct dress was made for dysentery and itch cases. The patients, in addition, were given this year a bi-weekly change of clothing as a routine measure. Bedding was daily aired and exposed to sunlight when it was available. The arrangements for washing clothes and linen are on the whole satisfactory.

Weaving was the main industry in Rangoon and Minbu.

The average cost of each insane was Rs. 324 in 1927 against Rs. 318 in 1926.

It has recently been suggested that the full cost of maintenance shall be borne by the Local Authority sending the insane to the asylum; and Local Governments in India are being circularised with a view to ascertaining what the practice is there. On receipt of such information, as may be available, the question of the distribution of the cost of maintenance on a more equitable basis may well come up for consideration.

The Committee of Visitors met each month and three members selected in rotation to visit the hospital at Tadagale.

Staff.—Major H. A. H. Robson, I.M.S., was Superintendent throughout the year. Major E. A. Picachy, I.M.D., and Captain F. H. O'Leary, I.M.D., were Deputy Superintendents at St. John's Road and Tadagale, respectively.

Dr. K. R. Menon was in charge at the Minbu Mental Hospital.

REPORT ON THE STATISTICAL RETURNS OF THE PROVINCIAL MENTAL HOSPITAL IN ASSAM FOR THE YEAR 1927. BY COLONEL G. HUTCHESON, I.M.S. INSPECTOR-GENERAL OF CIVIL HOSPITALS, ASSAM. SHILLONG. PRINTED AT THE ASSAM GOVERNMENT PRESS, 1928. PRICE, 1*s.* 5*d.*

THE main features of interest in the Report on the Statistical Returns of the Provincial Mental Hospital

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

in Assam for the year 1927, may briefly be summarised as follows:—

The total number of lunatics confined in the hospital at the end of the year was 437, of whom 352 were males and 85 females. During the year under report 63 (55 males and 8 females) were admitted into the Mental Hospital.

Three (2 males and 1 female and 2 criminal and 1 non-criminal) were re-admitted against 5 in 1926 and 7 in 1925. The intervals since discharge varied from 1 year 4 months to 6 years and 2 months.

The number of discharges excluding escapes and observation cases was 21 against 17 in 1926. Of these, all were discharged as "cured." The percentage of recoveries calculated on the daily average strength was 4.79 against 3.19 in the previous year.

There were 8 escapes (4 criminals and 4 non-criminals) against 5 in 1926; seven escaped from inside the palisade and 1 from the garden and all were re-captured.

The daily average strength was 438.47 against 438.38 in 1926.

No case was admitted for observation during the year.

On the 31st December, 1926, there were 214 criminal lunatics. Thirty were admitted and two re-admitted during the year; of these 246.9 were discharged and 23 died leaving 214 on the 31st December, 1927. The daily average strength was 213.39 against 212.12 in 1926.

Out of a total of 63 new admissions classified by religion, 48 were Hindus, 9 Muhammadans, 2 Indian Christians and 4 of other castes, 55 were males and 8 females. Of these 36 were natives of the province, 15 came from other provinces while the residences of the remaining 12 were unknown. In the province itself the districts of Sylhet and Cachar were responsible for the largest number of patients, viz., 14 and 7, respectively. Lakhimpur district actually sent the largest number of patients, but most of them belonged to provinces other than Assam.

As usual cultivators and tea-garden coolies furnished the largest number of admissions.

Between 20 and 40 years was the commonest age period.

The following types of insanity were admitted during the year:—

1.	Mania	34
2.	Melancholia	25
3.	Insanity due to cannabis indica or its preparations or derivatives ..	5
4.	Not yet diagnosed	2
	Total (including 3 re-admissions) ..	66

Predisposing causes were known in 25, exciting causes in 20 and both causes in 20 cases. No cause was assignable in 38 cases.

The total number of admissions to hospital was 226 against 155 in 1926 with a daily average sick rate of 59.35 against 50.68 in the previous year. This excludes cases of epilepsy, the daily average of which was 34.90 against 35.40 in 1926.

The marked rise in the number of admissions to hospital is due chiefly to "dysentery" and "all other diseases." Under the latter head, 24 cases of cholera are included. The number of admissions for diarrhœa increased from 3 in 1926 to 17.

Only 4 patients were admitted for malaria, due largely to the regular prophylactic issue of cinchona febrifuge. Only one case of influenza occurred.

The figures for tuberculosis are the same as last year, viz., 11.

Dysentery was very prevalent, 102 patients being admitted against 39 in 1926. Most of the cases were "amœbic" in type. There were 23 deaths from this cause in a total mortality of 47 against 11 in a total of 33 in 1926.

Cholera broke out on 29th September and continued till 14th October, attacking 24 inmates and causing 9 deaths. The patients were all in the convalescent and debilitated gang except one who was confined in a cell. This gang is fed separately near the hospital. No cases occurred in the healthy gang, or in female or tubercle enclosures, or in cells (except the case noted above). The Superintendent was unable to trace the exact origin of the outbreak, but it may have been due to a "carrier" or a new admission, as cholera was prevalent during the rains at every "ghat" on the river.

Under present conditions it is impossible to avoid the incidence of gastro-intestinal diseases from time to time, owing to the filthy habits of many of the inmates of a Mental Hospital and to overcrowding in the pucca barracks, which are limited in number. The temporary barracks remain more or less vacant as they are mostly unsafe and cannot therefore be utilised for patients who have dangerous propensities.

The percentage of new admissions in bad health was 13.64, indifferent health 54.54 and in good health 31.82, against 27.78, 53.70, 18.52, respectively, in 1926.

There were 47 deaths against 33 and 29 in previous years. The increase is due to the mortality from dysentery and cholera. Forty-one out of the total of 47 were due to dysentery 23, tuberculosis 9, and cholera 9. The figures for these diseases in 1926 were 11, 13, and *nil*, respectively.

Two patients died of pneumonia, one from an accidental injury to the spine, one from pyæmic infection and the other two from cardiac and renal diseases.

The male inmates are employed on cultivation of vegetables, sugarcane and jute, manufacture of gur, repairs to buildings and palisading, carpentry, tailoring and usual daily routine duties. The females are employed on paddy husking, preparation of species, grinding of pulse for cattle food, cleaning, etc.

All inmates are encouraged as far as possible to play various games and those who are literate are provided with books, newspapers and pictorial magazines.

There was no addition to the accommodation for inmates during 1927. The accommodation available including cells, hospitals and tubercle wards, was for 356 males 85 females or a total of 441. The maximum number confined on any one night during the year was 443.

Filtered water is supplied from the Tezpur Waterworks, but the supply is quite inadequate and it is necessary to supplement it from a well. The question of providing a separate pipe line for the Mental Hospital is under the consideration of Government and the Municipality. The food is good and sufficient. Extras are given to inmates in poor health and to tubercle cases.

Great care is taken in the matter of personal cleanliness, the daily bathing of all inmates and the regular washing and disinfection of beds, bedding and clothing.

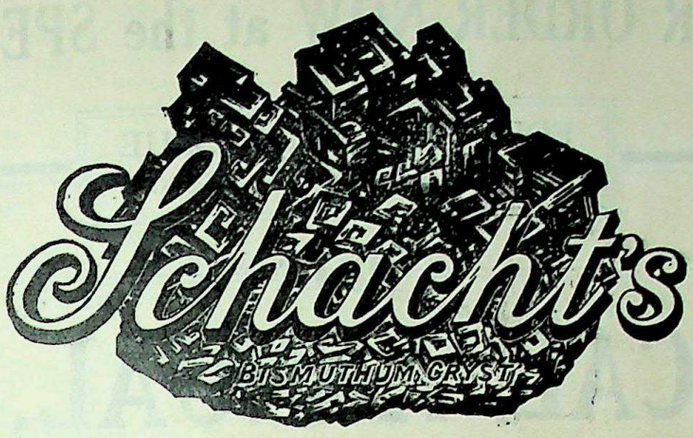
Night-soil is regularly trenched in a selected site on hospital land outside the stockade and infected stools are incinerated.

The reconstruction scheme of the Mental Hospital has made considerable and very satisfactory progress. Rupees 1,96,680 has been spent on original works during 1927. The female section is nearly complete and will probably be handed over by the engineers in about 2 months. In the male section a number of barracks are being built and work will shortly commence on the main wall. The lay-out of the site is excellent, and every provision has been made for ample accommodation for patients in up-to-date barracks, hospitals, cells, etc., as well as for staff and mental quarters with room for expansion. When the project is completed in about 2 years, the Hospital will be able to accommodate 690 inmates, against 441 at the present time. This will satisfactorily solve all the difficulties in connection with overcrowding, and the segregation of new admissions and special diseases, as well as relieve the jails of providing for criminal and non-criminal lunatics for long periods.

There is a steady increase in the number of criminal lunatics who constitute more than half of the total male population, the daily average having risen from 187.98 to 213.39 during the last 7 years. When vacancies

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri



Original Preparations

FOR THE USE OF

THE MEDICAL PROFESSION

LIQ. BISMUTHI "SCHACHT."

Absolutely pure and perfectly stable. The original preparation and the most physiologically active solution of Bismuth. Dose: One drachm, diluted.

PEPSINA LIQUIDA "SCHACHT."

A palatable, standardised solution of gastric juice from the pig. Useful in the treatment of dyspepsia. In ten-minim doses it gives excellent results in infantile diarrhœa. Adult dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO "SCHACHT."

Each fluid drachm contains in a concentrated form, besides the Pepsina Liquida, one fluid drachm of Liquor Bismuthi "Schacht." Dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO CO. "SCHACHT."

Contains one grain of Soluble Euonymin in each fluid drachm, in addition to the Pepsine and Bismuth. Dose: One drachm diluted.

BISEDIA.

A combination of Schacht's Liquor Bismuthi and Pepsina Liquida, with Morphia and Hydrocyanic Acid. Of the greatest value in the treatment of Acute Dyspepsia, Gastric Ulceration, Vomiting of Pregnancy, etc. Dose: Half to one drachm, diluted.

LIQ. CASCARÆ DULCIS "SCHACHT."

A palatable and very concentrated aromatic preparation of the finest Cascara Sagrada; free from bitterness and griping action. Dose: Quarter to one drachm.

LENIVA.

An excellent fruit laxative syrup, containing Alexandrian Senna, Figs, Prunes, Tamarinds, etc. Eminently suitable for delicate women and children. Dose: Half to two drachms according to age.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
BRISTOL, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOOK YOUR ORDER NOW at the SPECIAL PRICE

FORTY-SEVENTH ISSUE
NOW IN PREPARATION.

THE

MEDICAL ANNUAL, 1929

A Year Book of Treatment and Practitioner's Index
A Review of the Year's Progress in Medicine and Surgery

Subscribers, Pre-Publication, Rs. 11-8.
On Publication, Rs. 15-0 net.
Fully Illustrated in Colour and Black and White.

SOME CONTRIBUTORS TO THE NEW VOLUME.

J. H. ANDERSON, C.M.G., C.B.E., M.D.
JOSEPH BLOMFIELD, O.B.E., B.A., M.D.
W. LANGDON BROWN, M.A., M.D., F.R.C.P.
IVOR J. DAVIES, M.D., F.R.C.P.
HENRY DEVINE, O.B.E., M.D., F.R.C.P.
ALBERT EIDINOW, M.B., B.S., M.R.C.S.
JOHN FRASER, M.C., M.D., F.R.C.S.
A. G. GIBSON, M.A., M.D., B.SC., F.R.C.P.
A. M. H. GRAY, C.B.E., M.D., F.R.C.P.
E. W. HEY GROVES, M.S., M.D., F.R.C.S.
GEOFFREY HADFIELD, M.D., M.R.C.P.
L. W. HARRISON, D.S.O., M.B., CH.B., F.R.C.P.E., BREV.-COL., R.A.M.C. (Rtd.)
CHAS. THURSTAN HOLLAND, CH.M., M.R.C.S., L.R.C.P., F.R.C.S., D.L.
ROBERT HUTCHISON, M.D., F.R.C.P.
GEOFFREY JEFFERSON, M.S., F.R.C.S.
A. E. J. LISTER, M.B., B.S., F.R.C.S., LT-COL., I.M.S. (Rtd.)
J. P. LOCKHART-MUMMERY, M.A., M.B., B.CH., F.R.C.S
HUGH MACLEAN, M.D., F.R.C.P.
REGINALD MILLER, M.D., F.R.C.P.
JOSEPH PRIESTLEY, B.A., M.D., D.P.H.
SIR JAMES PURVES-STEWART, K.C.M.G., C.B., M.D., F.R.C.P.
SIR LEONARD ROGERS, C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S., LT.-COL., I.M.S. (Rtd.)
J. D. ROLLESTON, M.A., M.D., M.R.C.P.
W. G. SAVAGE, M.D., B.SC., D.P.H.
A. RENDLE SHORT, M.D., B.SC., F.R.C.S.
EDMUND I. SPRIGGS, M.D., F.R.C.P
SIR JOHN THOMSON-WALKER, O.B.E., M.B., F.R.C.S.
SIR W. I. DE COURCY WHEELER, M.D., F.R.C.S.I.
H. BECKWITH WHITEHOUSE, M.S., CH.M., F.R.C.S
A. DICKSON WRIGHT, M.S., M.B., F.R.C.S.
A. J. M. WRIGHT, M.B., F.R.C.S.
WILLIAM H. WYNN, M.D., M.SC., F.R.C.P.

Associate Editors : Medicine CAREY F. COOMBS, M.D., F.R.C.P. *Surgery* A. RENDLE SHORT, M.D., B.SC., F.R.C.S

Extracts from Press Notices of recent Volumes.

British Medical Journal.—"The 'Medical Annual' is an old and tried friend and its reappearance is always welcome ; the forty-sixth issue, with its array of able contributors and its wealth of practical information, fulfils our expectations."

Indian Medical Gazette.—"To the general practitioner in this country the 'Medical Annual' is a godsend. It enables him by the expenditure of a comparatively small sum to keep up to date in all branches of his profession. To the specialist also it is an extremely valuable publication."

THACKER, SPINK & CO., P. O. Box 54, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

occur the preference is given to criminal lunatics and then to most serious and chronic cases among non-criminals. Hence the percentage of recoveries to daily average strength is decreasing year by year.

All new admissions are vaccinated and treated with oil of chenopodium or carbon tetrachloride until found to be free from infection. Special attention is paid to cases of tubercle and pyorrhœa, and a prophylactic issue of cinchona febrifuge is given from May to October.

Lieut.-Colonel W. D. Ritchie, I.M.S., held charge of the Provincial Mental Hospital at Tezpur and Sub-Assistant Surgeon Mokhtar Hussain was the Deputy Superintendent throughout the year.

Correspondence.

THE ÆTIOLOGY OF NAGA SORE.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—In an original article published in the *Indian Medical Gazette,* December 1928, on the investigation into the ætiology and prevention of Naga sores in Assam, by D. N. Roy, M.B., D.T.M., the author lays stress on soil contamination as the probable cause of infection, but there are a few points which should be considered before arriving at this conclusion.

Since 1922 cement troughs containing a solution of phenyl have been gradually installed on all gardens in this practice, in which the majority of the coolies wash their feet twice daily on returning from work. These troughs are from 20 to 60 ft. long and are divided into two compartments, the first containing clean water, and the second a solution of phenyl which is deep enough to cover the lower third of the leg, the object of the first compartment is to cleanse the feet before proceeding into the disinfectant.

Each coolie on returning from plucking leaf has to walk through the trough in order to reach the weighing scales.

The result has been that cases of water sore, or *pani gao,* (for the prevention of which the troughs were intended), have decreased from the 1,612 in 1922 to 327 in 1928, which would tend to prove that the disinfecting solution was effective, but although it has proved effective in checking the number of cases of water sores, it has had no appreciable effect on Naga sores, and, if a batch of coolies were examined after returning from plucking or hoeing, it would be noticed that in very few instances was the soil adhering to the limb above the ankle but is often seen heavily coated on the feet, and yet the majority of the ulcers occur above the ankle.*

During the past year three Europeans were under treatment for Naga sores, one being a lady who avoids walking through the tea and the narrow paths in the garden, and is not particularly interested in her flower garden. The other two are tea house assistants, and their work is entirely indoor. In all of these cases the ulcers were well above the ankle. It has also been noticed that it is very seldom that any of the Indian staff are attacked although the Tellah babus have to walk through the tea in order to check the work, and as they do not wear trousers their legs are not protected. The only case that came under treatment was a Kerani babu who does office work only. Many coolies working in the tea house are affected, but in their case soil infection when going to the jungle in the early morning might be the cause.

In regard to the "eye-fly" being the transmitter of the disease, it is of interest that in 1927, there were 3,214 cases of Naga sores and ulcers recorded and 850 cases of ophthalmia, and in 1928, there were 1,800 cases of Naga sores and ulcers, and 1,126 cases of ophthalmia, so it would appear that the "eye-fly" is not the culprit; and yet the advent of the "eye-fly" and Naga sore are simultaneous.—Yours, etc.,

H. S. SMITH,
Medical Officer,
Baliserra Valley Estates.

KALIGHAT P. O.
SOUTH SYLHET, ASSAM.
The 1st February, 1929.

* *Manures.*—Practically the same kind of manures are used on all the gardens, and yet one garden may record many cases, and another in close proximity, and with similar soil may record but few cases.

THE INTRAVENOUS USE OF PITUITRIN.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With regard to the correspondence in your columns in 1925, for and against the intravenous use of "pituitrin" and "infundin" in your issues for March, June and September of that year, I beg to crave publicity to report my own experience of the procedure in two cases of extreme emergency.

The first patient, an adult male, when first seen by me, was found to be in an advanced stage of collapse with an imperceptible pulse. There was not an instant to be lost. I administered straightaway 1 c.c. of undiluted "Hypoloid Infundin" intravenously. The effect was magical; within a very few minutes what was apparently a dying man returned to life. Even I as a doctor was as amazed as the relatives to see the result. The case was one with very long-standing gonorrhœal complications, and death had appeared to be inevitable. Curiously enough, the injection proved to be the turning point in his illness, and from that moment the patient made a rapid and uneventful recovery.

Emboldened by this experience, I next tried the method in a case of pneumonia, an adult male, in whose facies at the time of crisis I read the signs of approaching death—a subnormal temperature with a runaway pulse, and a rapid dyspnœa with cold sweat on the forehead. At the instant when an intravenous dose of pituitrin was administered he stopped breathing, his eyes dimmed, and he appeared to have died, when suddenly he brightened up again, looked calm, felt comfortable, and the pulse and respiration became normal. He remained in a calm and comfortable condition for about thirty hours, when a second attack of heart failure carried him off before I could reach his house. This was a case of double pneumonia in a patient who was a confirmed drunkard and also the subject of untreated syphilis.

In neither case did I observe any of the train of symptoms mentioned by your correspondents, e.g., "sudden and intense pain in the chest and back, orthopnœa, paleness, and a terrified look," "colicky pains in the abdomen and pelvis."

With regard to the intravenous use of the drug in a diluted state, I have used it as a routine procedure in innumerable cases of cholera with the first pint of hypertonic saline, and always to my great satisfaction.

I am convinced that the intravenous use of pituitary extract should have a wide field of application in situations where no time is available for resort to other methods of injection. The question is to settle the best dilution that would be both safe and handy. It would help the general practitioner if either Messrs. Burroughs, Wellcome & Co. or Messrs. Parke, Davis & Co. would carry out the experiments necessary to determine this point, publish the results and place the prepared diluted solutions on the market.—Yours, etc.,

R. K. BHATTACHARYA, M.B.

NABADWIP, BENGAL.
25th January, 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Service Notes.

APPOINTMENTS AND TRANSFERS.

Brevet-Colonel G. D. Franklin, C.I.E., O.B.E., I.M.S., an Agency Surgeon, on return from leave, is posted as Residency Surgeon, Hyderabad, with effect from the 30th December, 1928.

Bt.-Colonel R. McCarrison, C.I.E., M.D., F.R.C.P., K.H.P., I.M.S., an officer of the Medical Research Department, is placed on foreign service under the Indian Research Fund Association, with effect from the 8th January, 1929.

Major J. Rodger, M.C., I.M.S., is appointed to officiate as an Agency Surgeon and is posted as Residency Surgeon, Mewar, with effect from the 7th January, 1929.

The services of Major P. D. Chopra, I.M.S., are placed permanently at the disposal of the Government of the Punjab, with effect from the 9th June, 1928 for employment in the Jail Department.

LEAVE.

Lieutenant-Colonel J. L. Lunham, I.M.S., is granted leave for six months with effect from the 30th April, 1929, or date of availing.

Lieutenant-Colonel H. M. H. Melhuish, D.S.O., I.M.S., Director of Public Health for the Government of Bombay, is granted leave for three months with effect from the 25th February, 1929, or the subsequent date or relief.

PROMOTIONS.

Majors to be Lieut.-Colonels.

A. J. Lee, M.B. Dated 30th January, 1929.

C. H. Smith, O.B.E., M.D., F.R.C.S., A. M. Dick, O.B.E., M.B., F.R.C.S., M. J. Holgate, O.B.E., M.B., T. L. Bomford, M.D., W. A. M. Jack, O.B.E., M.B., A. C. Anderson, K. S. Thakur, E. H. V. Hodge, M.B., G. T. Burke, M.D., M. A. Nicholson, M.B.—Dated 31st January, 1929.

Captains to be Majors.

D. Sanyal, M.B. Dated 5th January, 1929.

S. M. A. Faruki, M.D. Dated 6th January, 1929.

B. B. Gadgil, M.B. Dated 6th January, 1929.

Fazal-ud-Din, O.B.E. Dated 13th January, 1929.

P. N. Basu, M.B. Dated 16th January, 1929.

Haji Mohammad Salamat-Ullah, M.C., M.B. Dated 5th February, 1929.

R. Sen. Dated 7th February, 1929.

Lieutenant to be Captain.

V. A. Edge. Dated 16th December, 1928.

RESIGNATION.

Lieut. S. N. Evans. Dated 27th February, 1929.

NOTES.

VITAMINE THERAPY.

THE British Drug Houses, Ltd., are a well-known and most reliable firm of manufacturers, and their recently issued booklet on "Vitamin Therapy" will be of great interest to the medical profession in India. This booklet gives in summarised and illustrated form a resumé of our present-day knowledge of the vitamines. It contains a brief outline of the whole question of the medicinal use of those vitamines which are lacking in natural foodstuffs; the occurrence and distribution of these vitamines in nature; their functions, processes of manufacture, and methods of standardisation. It also fully describes their vitamine preparations—Radiostol, Radiostoleum, and Radio-Malt. Finally, there is an interesting account of the standard to which their vitamine products are made to conform. The British Drug Houses, Ltd., 16-30, Graham Street, City Road, London, N. 1. will be glad to send a copy of this booklet to any *bona fide* medical practitioner in this country who is interested in the subject. The pamphlet is very well got up and very well illustrated, and contains essential information for the general practitioner who has not had the leisure to absorb recent work on the value and use of the vitamines.

"SALVITÆ."

A MOST elegant preparation for use in conditions of gout, rheumatism, alimentary intoxication, migraine, nephritis, and acute inflammatory affections of the urogenital tract is "Salvitæ," prepared by the American Apothecaries Co. of New York. Its composition is stated to be as follows:

Strontii lactas ..	0.30	
Lithii carbonas ..	0.15	parts
Caffeine et Quininæ Citras ..		0.80
Sodii-forma-benzoas ..	1.60	
Potassi et sodii citro-tartras ..		59.0
Mangesii sulphas ..	8.0	
Sodii sulphas ..	30.0	per 100 parts.

It is obvious that such a formula is one especially adapted to combat acidosis, from whatever cause. It is antiseptic, depurant, diuretic, and anti-putrefactive. The dose suggested is from one to four teaspoonfuls dissolved in a glassful of water morning and evening.

In gout at least, the preparation has most soothing qualities, as we can testify from its use in a recent case. It is mildly aperient and of value in both specific and non-specific urethritis. It may be taken either in small doses as a diuretic, or in larger doses as a mild saline aperient.

The Indian agents are as follows, and they will be glad to supply literature and samples of the preparation to the medical profession in this country:

Messrs. Muller, MacLean & Co., 8, Old Court House Street, Calcutta.

Messrs. Muller, MacLean & Co., 118, Gunbow Street, Fort, Bombay.

G. Y. Knight & Co., 71, Lewis Street, Rangoon.

Messrs. Wilson & Co., 5-8, Jehangier Street, Georgetown, Madras.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India. Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

"COOLY ITCH."

A PURULENT FOLLICULITIS DUE TO THE TRICHOPHYTON VIOLACEUM VARIETY INDICUM.

By HUGH W. ACTON,
LIEUTENANT-COLONEL, I.M.S.,
Director, Calcutta School of Tropical Medicine and Hygiene,
and
C. McGUIRE, D.T.M.,
Under the Indian Research Fund Association.

THE term "cooly itch" has been used to designate a type of pustular folliculitis affecting the lower classes (Indians), viz., coolies, etc., and is seen commonly on the thigh and legs. Unfortunately the use of this term has been extended to any form of purulent dermatitis, including scabies, because few attempts have been made to find the causative organism. Castellani employs the term "cooly itch" in a more restricted sense to an extremely irritative dermatitis that commonly attacks the lower classes, and is rarely seen amongst Europeans. He has not been able to find any causative agent, either fungi or insect parasite, and suggested that these lesions might be caused by some insect parasite that only remains on the body for a short time, analogous to the mite (*Tyroglyphus longior* Gervais) causing copra itch. As far back as 1922, the senior author recognised this chronic pustular folliculitis as a separate entity, and noticed that in men the pustules occurred round the hair follicles of the legs and thighs, and in women around the hair follicles of the forearm. Besides the pustules round the hair follicles, there was a good deal of perifollicular induration and inflammation, which gave rise to a peculiar purple coloration round each inflamed follicle. The disease is very intractable, and resists every form of local treatment by the ordinary parasiticidal remedies. The disease could only be cured by depilating the hairs in the area by *x*-ray exposures, showing that the causative agent grew along the hair shafts. At that time, we had not seriously undertaken any research on the subject, and we could only recover staphylococci and very rarely streptococci, in the few attempts made to isolate the causative organism. At first we considered the main cause of the chronicity and intractability of the lesions was due to the continual cross rub of the infected *dhotie* (loin cloth) or *sari* during the act of walking, etc. We could not advise our patients to change their clothes repeatedly as the majority of them only possessed a single loin cloth, nor to adopt any other method of dress, such as trousers;

[illegible] 25°–27°C [illegible] ation i[illegible]925 [illegible] growth is 12 [illegible] investigations [illegible] the [illegible] our researches [illegible] the [illegible] different skin diseases [illegible] (Ca[illegible] One of us (C. McG.) has [illegible] time during the past three years [illegible] f the various cryptogamic fungi [illegible] the skin and hair follicles.

We soon discovered that this type of persistent pustular folliculitis was due to a *Trichophyton* closely resembling *T. violaceum* (Bodin), previously described and cultivated by numerous other workers. The *Trichophyton violaceum* attacks the hair of the scalp and beard and more rarely the glabrous skin and nails; the variety we have isolated attacks the hair follicles of the thigh, leg, forearm, front of the chest, beard and the back of the neck. So far we have not observed it to attack the scalp hairs except by extension from the beard area to the hair margin of the scalp and back of the neck. This variety of *Trichophyton violaceum* we proposed to consider as a subvariety and name it *indicum*. It differs from the *Trichophyton violaceum* (Bodin) in cultural appearances, but not in morphology; we consider the difference in cultural appearance not significant enough to enable us to describe it as a new species.

The clinical recognition of this type of ringworm folliculitis is extremely easy for any one who has seen a few cases of the disease, or has studied our water colour paintings. The demonstration of the fungi from the lesions by cultivation is, however, a very different matter, as it is difficult to isolate this fungus in pure culture. The difficulty is due to various causes, (1) the fungi are found in the more recent pustules and are not numerous on the hairs, so that selected pustules have to be examined. (2) The concomitant staphylococcal colonies, which are much faster in growth, overrun and strangle the fungal colonies. (3) The minute fungal colonies with their penetrating roots may be seen after the first days of insemination, but one is unable to subculture the fungi from these roots. (4) Any method we used to kill the staphylococcus generally succeeded in killing the trichophyton as well. Thus out of the cases diagnosed clinically we have only been able to obtain successful cultures in one out of every three or four cases, in spite of the fact that in most of the attempts we have seen submerged roots of the fungus invading the media.

During the course of this research we tested various chemical and physical means to inhibit the growth of the staphylococcal colonies, we found that gentian violet in 1 : 25,000 solution not only inhibited the staphylococcus but also killed the trichophyton. There is no doubt that, if every case of sycosis were carefully examined by a competent mycologist, the clinical entity would disappear from dermatological nomenclature and be regarded as a clinical manifestation of trichophyton ringworms. We found clinically that although the cases were refractory to the ordinary

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

para[illegible] as they [illegible] solution [illegible] violet. [illegible] object [illegible] ment, the [illegible] of the skin [illegible] there is no doubt about its efficiency.

ÆTIOLOGY.

The disease is common amongst Indians of the lower classes in Calcutta, and is rare amongst Europeans. The few cases we have seen amongst the latter were mostly seafaring men, viz., officers of the mercantile marine, who are accustomed to walk about the decks in the early morning barefooted with their trousers tucked up above the knees. In Indians, the disease is seen largely amongst the cooly classes, and much more rarely amongst the middle and upper classes. The disease is more common amongst men than women; in men the lesions are seen round the hair follicles of the thighs and legs, and in women round the hairs on the forearm. Wrestlers are particularly liable to the disease, and hence the frequency amongst Indian policemen and *durwans* (gate keepers) who are keen wrestlers. In India the wrestling bouts take place on a small plot of land which is marked out and the earth well dug up to make the ground soft in order to lessen the impact of the throws. Preparatory to each bout, the combatants rub their bodies over with this soft earth to make themselves less greasy. During the contest, the whole of their bodies including the scalp gets well rubbed over with this earth. The fungus can live in the soil and thus gain an entrance into the hair follicle. In spite of this fact, only the hair follicles in the areas mentioned above get infected with this fungus.

There is little doubt that the cross rub of the clothes—*dhotie* and *sari*—that occurs during walking, etc., plays a very important part in the spread of the ringworm as well as in the secondary staphylococcal infection. The poorer classes can rarely afford more than a single garment be it a *dhotie* or *sari* to cover their bodies, and these clothes cannot usually be washed properly in soap and water. The dirty clothes tend to increase the incidence of the disease amongst them, and when once infected help to spread the disease from one hair follicle to the next. In a previous paper on *Tinea cruris*, Acton and McGuire (1927) showed the importance of moisture and friction in this common ringworm and how infection took place from the damp infected ground on to the thin glabrous skin of the feet. In this trichophyton infection, the source is again from the ground when the soil is dry and greasy, and the fungus only invades the hair follicle by prolonged contact in those who are not clean about their personal habits of bathing, etc. Dryness and friction from the clothes are important factors in the spread of this ringworm from one follicle to the other.

SIGNS AND SYMPTOMS.

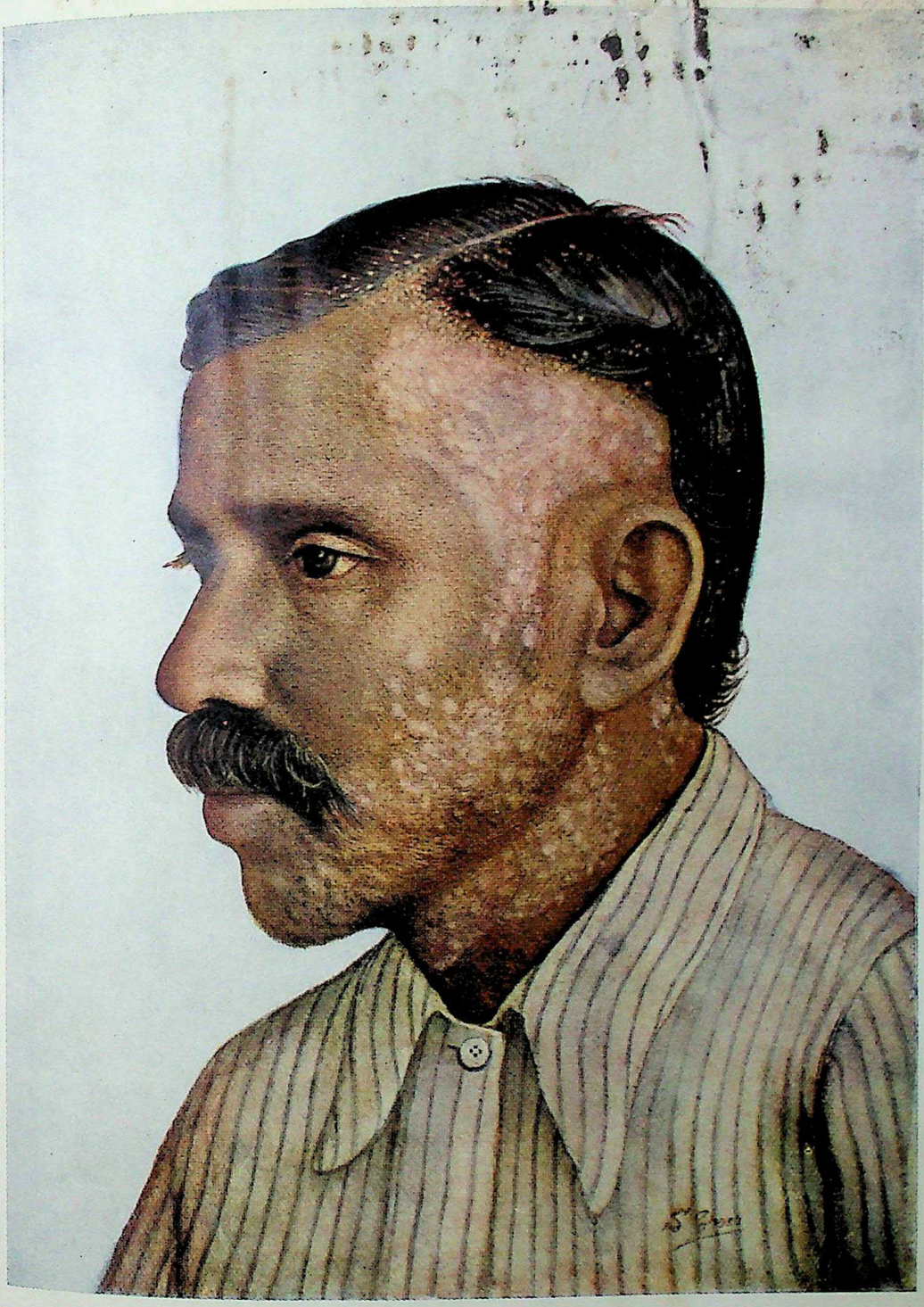
The subjective symptom is intense irritation, causing the patients to scratch, in order to open up the pustules or inflamed nodules and so relieve the inflammatory tension. The irritation becomes much more marked when the lesion has existed for some time and the induration has spread into the corium (*see* Plate IV, fig. 2). The typical lesion exhibits the following characters in the earliest stage when examined by a corneal lens of 10 magnifications. The hair shaft is surrounded by a tiny area of thickened epidermis, a greyish looking squame, which is not detached, and, where the epidermis is thinner, numerous fine dilated vessels are seen at the margin. Some of these areas go on to suppuration, a small pustule forming superficially round the entrance of the hair follicle so that the squame is lifted up and domed forming the upper boundary of the pustule; at first it is a greyish yellow colour and later on becomes a brighter yellow when pus has formed in it. The pustules are surrounded by a reddish purple zone of induration (inflammatory) which sometimes extends for some distance into the surrounding corium, producing nodular areas round each hair shaft. Many of these areas do not suppurate, and take a long time to break down. These reddish purple nodules round the hair follicles, some purulent and others not, are very characteristic of this ringworm infection (Plate I). In the beard area, the induration of the corium sometimes produces kerion, but on the legs the induration is more diffuse, so that the whole area of the skin becomes indurated and here and there pus points are seen round the hairs. At this stage, owing to the scratching and tearing of the skin, secondary infection by streptococci occurs; this only increases the induration (Plate IV, fig. 2) and changes the picture of the skin lesion to that of a weeping eczema (Plate IV, fig. 3).

The lesions are most commonly seen on the legs (Plate IV, fig. 1) starting on the outer side of the leg and extending along the hairs in this area. The induration extends into the corium (*see* Plate IV, fig. 2) and later may be followed by eczema (Plate IV, fig. 3). At other times it may start around the hairs of the thigh (*see* Plate IV, fig. 4), and in either case may become more widespread (Plate II), infecting almost every hair in the area. In women the lesions are more commonly seen on the extensor surface of the forearm (Plate III, fig. 1) where the hairs are more numerous and subjected to the cross rub of the *sari*. More rarely the hairs on the back of the hand (Plate III, fig. 3) may also be invaded by this fungus. The coarse hairs on the front of the chest are sometimes involved (Plate III, fig. 2) in an area which is frequently the site of acne as well, but the characteristic reddish purple colour of the nodules that have not as yet suppurated should prevent such a mistake being made by the physician. In men, the beard area is often attacked, giving rise to sycosis barbæ (Plate I), in this particular case as far as the temporal region. As a rule the scalp hairs are not attacked by the fungus, but the fine hairs on the back of the neck are sometimes invaded,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

25–27° ((n 1925.
growth is 12
above the rfa
arance; the
colour.
PLATE I. ly 3 mm
mall



Sycosis barbæ due to *Trychophyton violaceum* var. *indicum* with secondary staphylococcal folliculitis. Note the characteristic purple colour round the follicles.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

para
they vie
violet. Th
ment, the
is loth about it

ETIOLOGY
ama

es.

up the
the i
come

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

25 –27°C (n 1925.
growth is 12
above the rfa
appearance; the
rown colour.
or, only 3 mm
nd a small
is an

PLATE II.

Extensive folliculitis of the hairs on the thigh and leg due to *Trichophyton violaceum* var. *indicum*.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

para
they vie
violet
ment, t

es.

enc

st

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

25 –27°C (n 1925.
growth is 12
PLATE III. above the rfa
ppearance; the
rown colour.
oor, only 3 mm
ied and a small
ich is an

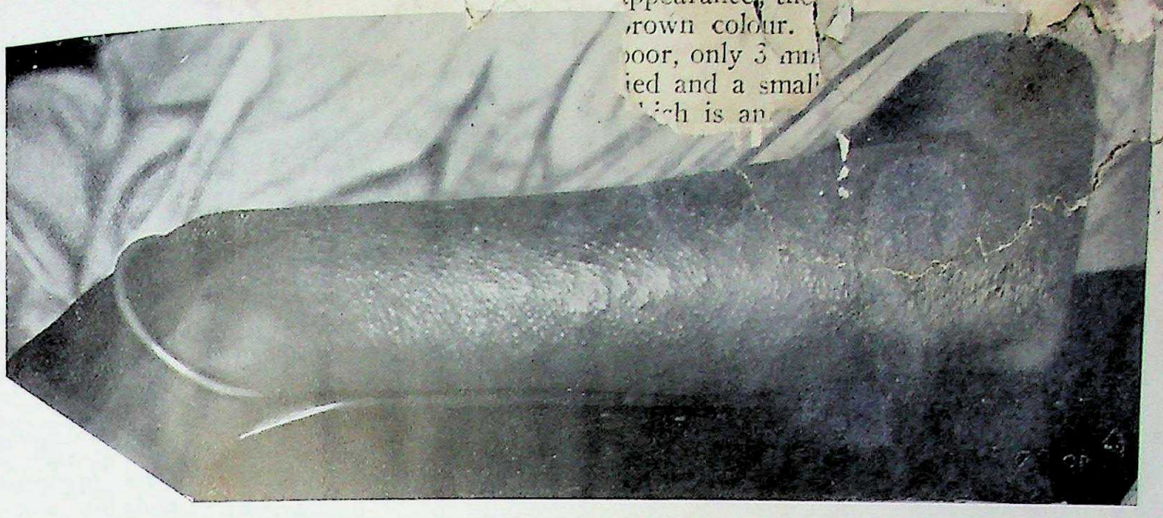


Fig. 1.—Trichophyton folliculitis on the forearm of a woman; note the effect of the cross rub of the *sari* in spreading the infection.

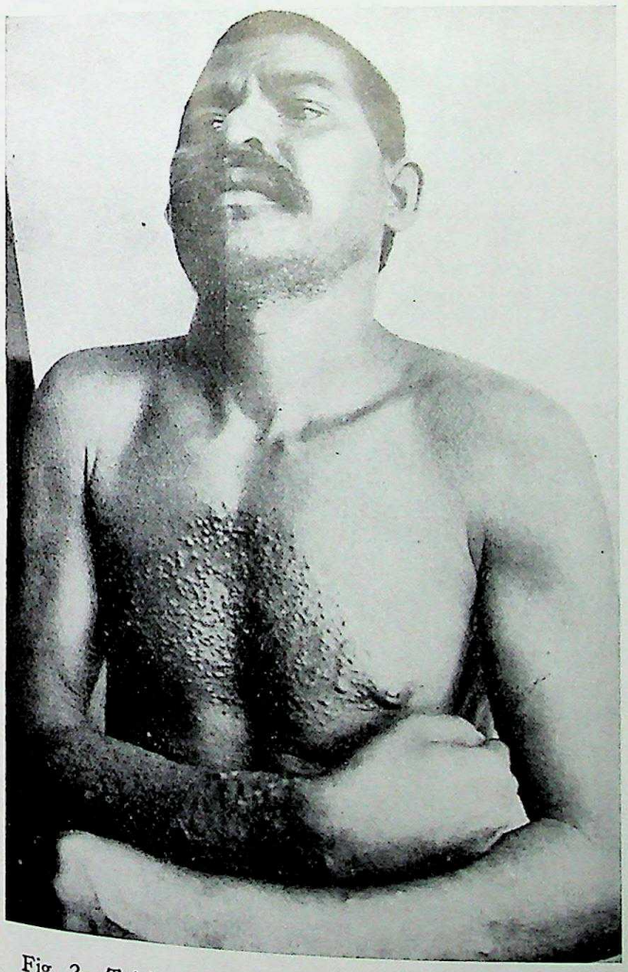


Fig. 2.—Trichophyton folliculitis of the hairs on the chest somewhat resembling acne.

Fig. 3.—Folliculitis due to the same cause on the back of the hand.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

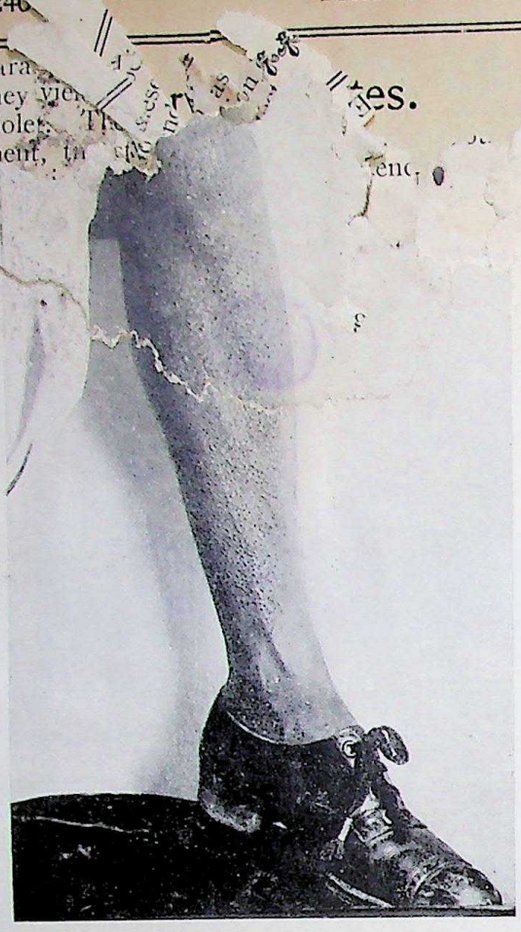


Fig. 1.—Early trichophyton folliculitis without much induration of the corium.

Fig. 2.—Trichophyton folliculitis with extensive induration of the corium.

Fig. 3.—Trichophyton folliculitis with secondary streptococcal dermatitis eczema.

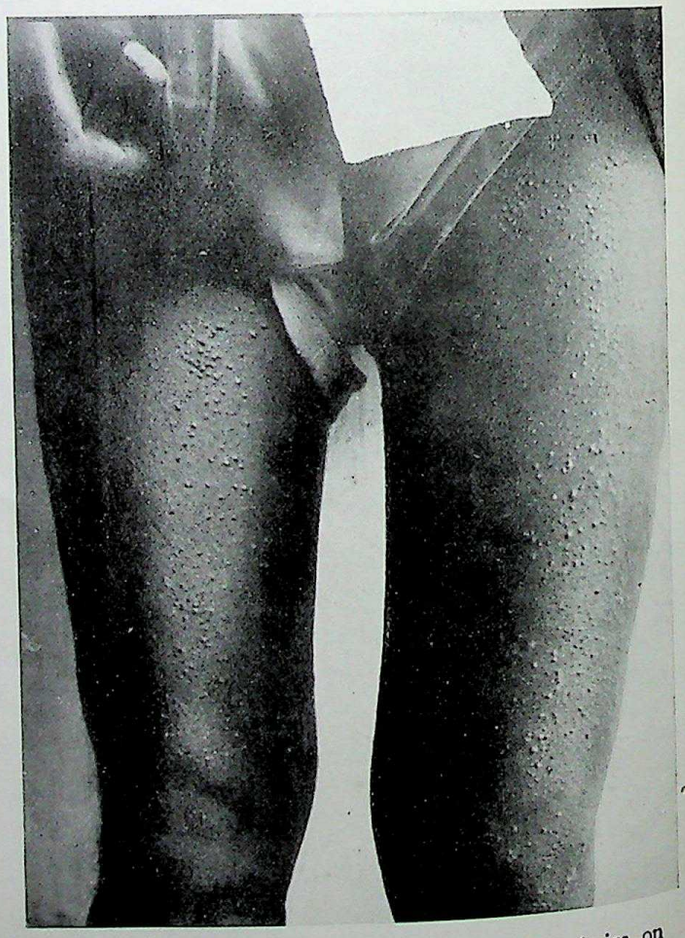


Fig. 4.—Early trichophyton folliculitis of the hairs on the thigh.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

particularly those subjected to the cross rub of the collar or coat.

MYCOLOGY.

The first essential is to describe *the method of cultivation* adopted by us. An inflamed hair follicle is selected from the edge of the lesion and it is better to select discrete follicles, where the pus formation is beginning to occur round the hair shaft. It is impossible to get pure cultures either from large ripe pustules round the hair follicles or when a good deal of secondary infection with involvement of the corium has occurred in the centre of the lesion. The area is selected and the skin surface sterilised with absolute alcohol, each pustule is opened with a sterile needle, and a small loopful of the pus taken up and inseminated into three tubes of Sabouraud's maltose agar. In this manner the contents of six small pustules are sown on 18 culture tubes. In only one out of every four attempts are cultures successful for secondary implantation, as the more rapidly growing staphylococcus colonies overrun the more slowly growing fungal mycelium. In these infected cultures, even when the tube is broken and only the roots of the fungus that have invaded the media are taken up free of staphylococci, these root mycelia will not grow into colonies as in the allied cryptogamic fungi. When the colonies are separated from the staphylococcal colonies, secondary cultures can easily be made from the surface growth on most laboratory media at room temperature, i.e., 25—27°C. At present, we have not been able to evolve a method of cultivation such that we can hinder the growth of the staphylococci and allow the fungus to grow in pure culture. In most cases we are able to see the roots of the fungi penetrating the media, but less commonly, i.e., in only 1 in 4 cases, can we get pure subcultures.

Cultural characters.—On Sabouraud's test maltose agar (Plate V) at the end of the first week the colony is about 8 mm. in diameter, circular in shape, and raised above the surface level of the media. The centre of the raised area exhibits spicular projections into the air—aerial hyphæ. The colony is violet coloured, and when looked at from the side, thick dense roots are seen penetrating deeply into the agar media. After one month, the growth is 13 mm. long, ovoid in shape and very much raised above the surface of the agar, it has now a velvety mole-coloured appearance, very much like the colour and texture of the fine fur of this animal. The roots have penetrated through the media to the glass of the test tube, and are difficult to see, as the agar is pigmented a dark red brown to almost black colour. The growth on Sabouraud's maltose agar in an Erlenmeyer's flask after two months' growth is depicted in Plate V.

A description will be given of the appearances of the growth on the other media, seen after one month, incubated at room temperature between 25—27°C. [illegible] n 1925. growth is 12 [illegible] above the [illegible] and h[illegible] appearance; the [illegible]dium is pig[illegible] brown colour. [illegible] blood serum [illegible] poor, only 3 mm. in diameter, the serum is liquefied and a small pit is formed, at the bottom of which is an area of growth. On peptone agar the growth is 5 mm. in diameter, raised above the surface, of a light mole colour, the media being pigmented a red brown colour. On potato the growth is 12 mm. in diameter, raised, brown in colour, but not velvety in appearance, the potato being dark in colour. On carrot the growth is 9 mm. in diameter, chocolate coloured, non-velvety in appearance, slightly raised; the edge of the growth is crenated and the surface rugose. On 2 per cent. glycerine agar, the growth is only 2 mm. in diameter. On 4 per cent. honey agar there is no growth.

The growth on synthetic media.—We next carried out an elaborate series of experiments to test the different constituents of the media in order to see what effect they would have on the growth of the different ringworm fungi. Our object was to devise a stable synthetic medium which would not hinder the growth of these fungi, but at the same time prevent pleomorphism. The objections to Sabouraud's media are two-fold, as he insisted that the peptone and glucose should be derived from two sources, viz., Chassaing's peptone and Chanut's glucose. Neither of these two substances are simple chemical compounds; however carefully the peptone is prepared it must vary slightly in its mixture of protein-like bodies, whilst Chanut's glucose cannot be obtained, so we have to use Merck's glucose, which under the best conditions is a very unstable sugar. We therefore considered it necessary to test the effect of varying the quantities of Sabouraud's test media, as regards its pH, the salt content and the amount of agar to see what effect these alterations would have on the growth of these fungi. It would be out of place to give the details of these experiments, but it is sufficient for our purpose to say that the best results obtained on these test media were given when the media contained 2.5 per cent. agar, the sodium chloride content 0.5 per cent. and the pH about 7. An alteration in the pH from 5 to 10 had very little effect on the growth of these different fungi. We next eliminated the peptone from the test media, and tried the different amino-acids to see how they would act as a substitute for peptone. We found the following combination of amino-acids to give the best results; argenine nitrate, sodium aspartate and tryptophane. We had now a synthetic media containing 2.5 per cent. agar, sodium chloride 0.5 per cent., pH of 7 and the above-mentioned amino-acid. The different sugars had to be tested. We found that saccharose was not only the most stable sugar but also the most suitable for our media. We were therefore able to devise finally a synthetic medium for our secondary cultures;

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

[illegible] the growth [illegible] fun[illegible] ents [illegible] morphism. The [illegible] are able [illegible] lium for at least [illegible] months. [illegible] all our p[illegible] cultures are made [illegible] Sabouraud's medium, an[illegible] the subcultures next tested on the synthetic medium, in order to prevent pleomorphism, etc. The composition of the medium is as follows:

Argenine nitras	..	0.1 grms.	Mercks.
Tryptophane	..	0.05 grms.	Mercks.
Sodium aspartate	..	0.5 grms.	Mercks.
Saccharose	..	0.4 grms.	
Agar	..	2.5 grms.	
Sodii chlor.	..	0.5 grms.	
Water	..	100 c.c.	

pH 7.

The growth after one month on this media is depicted in Plate V. The size is 15 mm. in diameter, the central portion is raised, black in colour, 10 mm. in diameter, around the raised area is a depression and outside this depression is a flat orange-coloured growth with fine radiating furrows. The medium is slightly pigmented. As a comparison in the same plate (Plate V) the appearances of *Trichophyton violaceum* are shown on Sabouraud's test medium and on our synthetic medium.

MORPHOLOGY.

Plate VII, fig. 4, photomicrograph, 2|3rd inch objective No. 10 ocular, shows how the roots of the mycelium penetrate into Sabouraud's maltose agar after one month's growth. The sections were made as follows. The glass tube containing the culture was broken and freehand sections were made across the agar media by means of a Gillette blade. These sections are allowed to dry, fixed, and then stained with weak carbol fuchsin. The mycelium is seen to consist of three parts. There are a few aerial hyphæ carrying the end organs of fructification, most of which have been lost during section, drying, etc. A very thick felted mass of surface runners or surface hyphæ by means of which the growth of the mycelium extends over the surface of the medium by a centripetal spread producing the round appearance of the ringworm. From these surface runners or hyphæ, deep roots penetrate into the media and sometimes go as far as the glass on the other side of the test tube. When viewed laterally, these root hyphæ form solid masses, particularly if the medium has been broken and air allowed to enter the crevice.

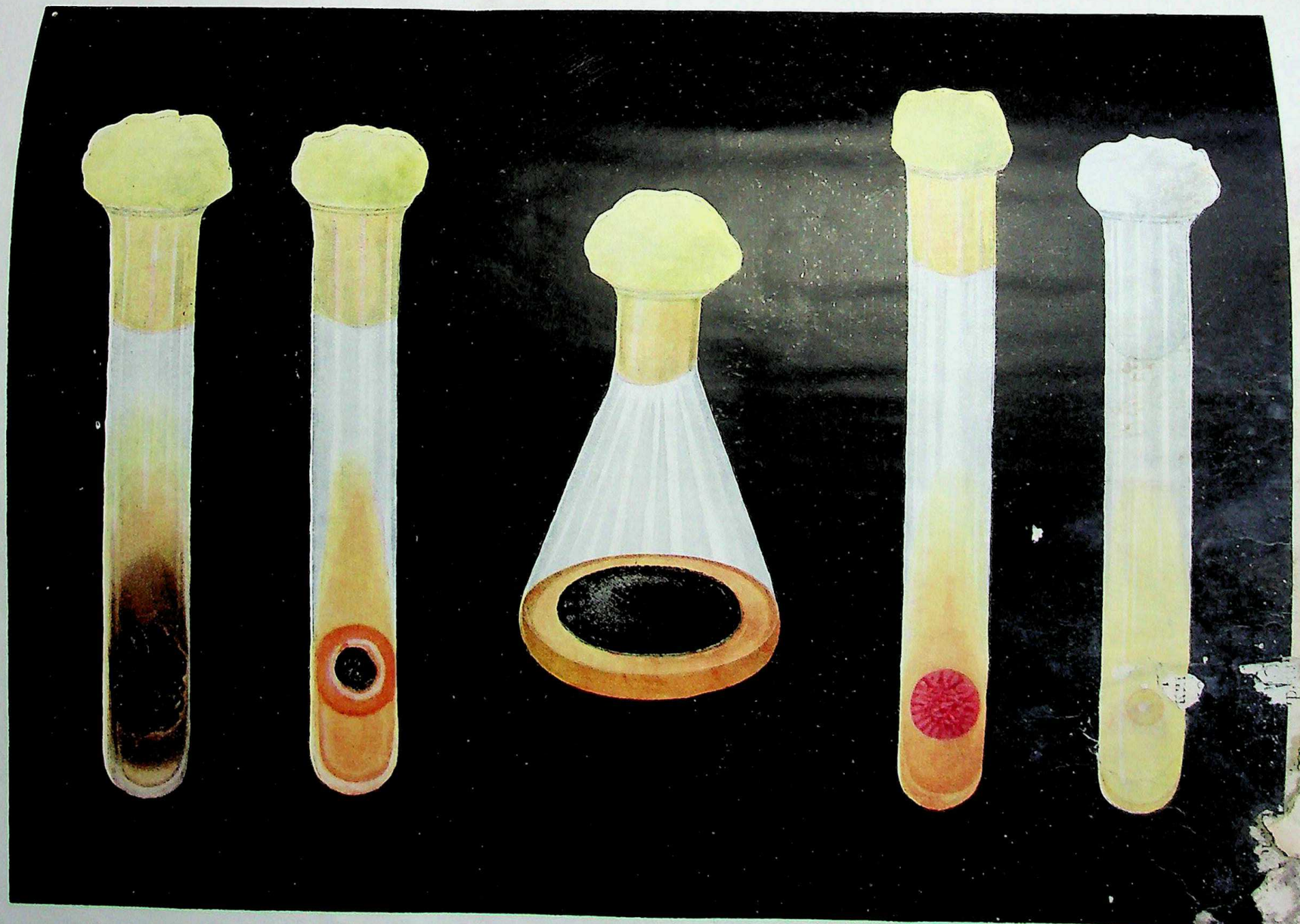
In Plate VIII, fig. 5, photomicrograph of these root hyphæ, 1|6th inch objective, No. 10 ocular, the older roots are seen to be segmented and the younger roots non-segmented and more uniform in their staining. We have tried various methods to obtain the exact picture of the relationship of the aerial hyphæ in sections in the downy and non-downy portions of the mycelium, but we have so far failed in our object. So we have to describe the appearances seen in hanging drop culture on Sabouraud's media. Plate VIII, fig. 6, is a drawing made with an Abbé's camera lucida, the magnification being 1|6th inch objective and No. 10 ocular. A composite drawing gives a better idea than a photomicrograph as the aerial hyphæ are at different levels of focus. At the ends of the hyphæ are seen rounded uncoloured organs of reproduction, the chlamydospores. Along the hyphæ, thickenings of these elements will be seen as ovoid or rounded swellings, the intercalary chlamydospores. We have never observed any other variation in these aerial hyphæ except the two types of chlamydospores mentioned above.

In the pus taken from the recent pustules we have seen these end chlamydospores staining a deep purple with Manson's borax methylene blue and surrounded by a capsule.

Morbid histology of the pustules.—Plate VI, fig. 1, photomicrograph taken with the 2|3rd inch objective and No. 10 ocular, is a section made through an infected hair follicle with early pustulation. The abscess is seen forming at the top of the hair follicle and only extending half way down the follicle so as not to affect the hair roots. Thus in this type of ringworm there is no baldness. Infiltration of the surrounding corium is taking place which later on gives rise to induration. Plate VI, fig. 2, photomicrograph, 1|6th inch objective and No. 10 ocular, gives a magnified view of the pustule which is situated at the top of the hair follicle; whilst Plate VII, fig. 3, is a photomicrograph made with the same magnification as given above in Fig. 2. The inflammatory process extends as far down as the top of the hair bulb, but the hair bulb is not affected by it so that the growth of hair is not interfered with in any way.

The schematic position of the fungus.—Many observers might consider this species to be a new one and different from *Trichophyton violaceum*. The essential differences would be that one species attacks the hairs of the head and beard, the other those of the beard and body. In one the mycelium is violet in colour and in the other it has a mole-like velvety appearance. Now the classification of these ringworm fungi is based on the morphological appearances as seen in hanging drop preparations after one or two months' culture. In both of these fungi we have the same type of organs of fructification, i.e., end chlamydospores and intercalary chlamydospores, so that they appear to be similar in morphological appearances. We have next to decide (1) are these differences in colour or (2) is the situation of growth sufficiently distinctive to create different species? We have always observed in our studies that coloration of these fungal colonies is largely a question of media. This is seen in Plate V. The European variety of *Trichophyton violaceum* loses all its colour on our synthetic medium; this may be perhaps due to continual laboratory cultivation; whilst our cultures become less mole-like in appearance and approach the Sabouraud's cultures of *Trichophyton violaceum*. The growth of the fungi on different parts of the body is largely a question of suitability of soil and not a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar



Cultures of *Trichophyton violaceum*. One month old cultures—reading from left to right. Variety *indicum*, on Sabouraud's maltose agar, synthetic media, and on an Erlenmayer's flask of maltose agar. The European variety of *Trichophyton violaceum* on Sabouraud's maltose agar and on synthetic media.

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

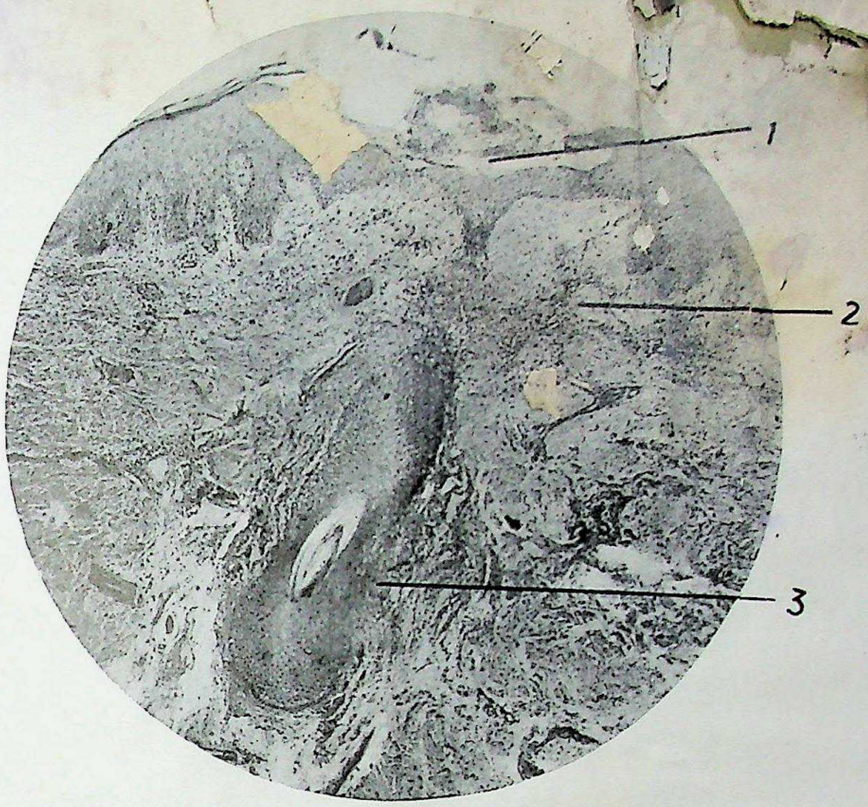


Fig. 1.—Section through an infected hair follicle: (1) Note the abscess at the upper part of the hair follicle; (2) infiltration of the corium; (3) hair root. (2|3rd Objective and No. 10 Ocular.)

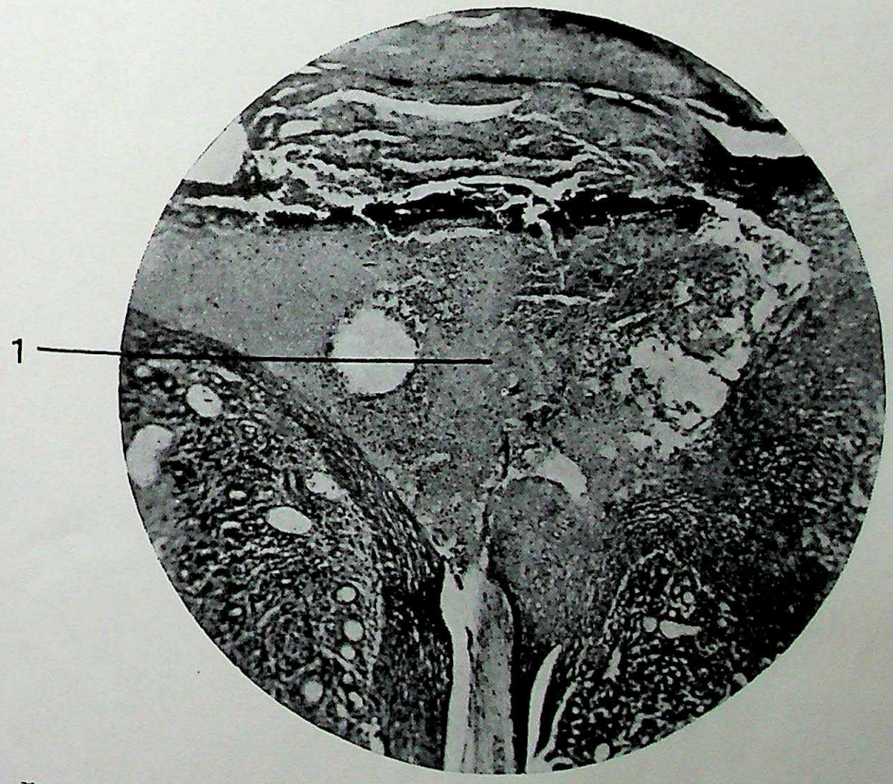


Fig. 2.—Magnified view of the pustule at the top of the hair follicle. (1|6th Objective and No. 10 Ocular.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

but not sufficiently to j
a separate species.
lisease can now be
5 per cere gentia
area three daily
marked induratio
of the
out

PLATE VIII.

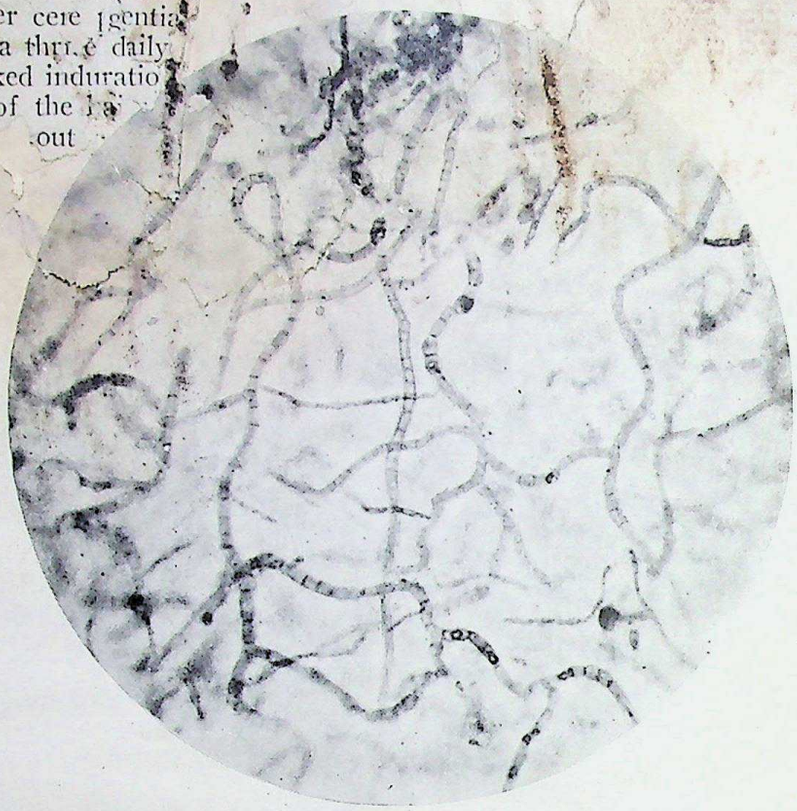


Fig. 5.—Roots more highly magnified, the older roots are segmented. (1|6th Objective and No. 10 Ocular.)

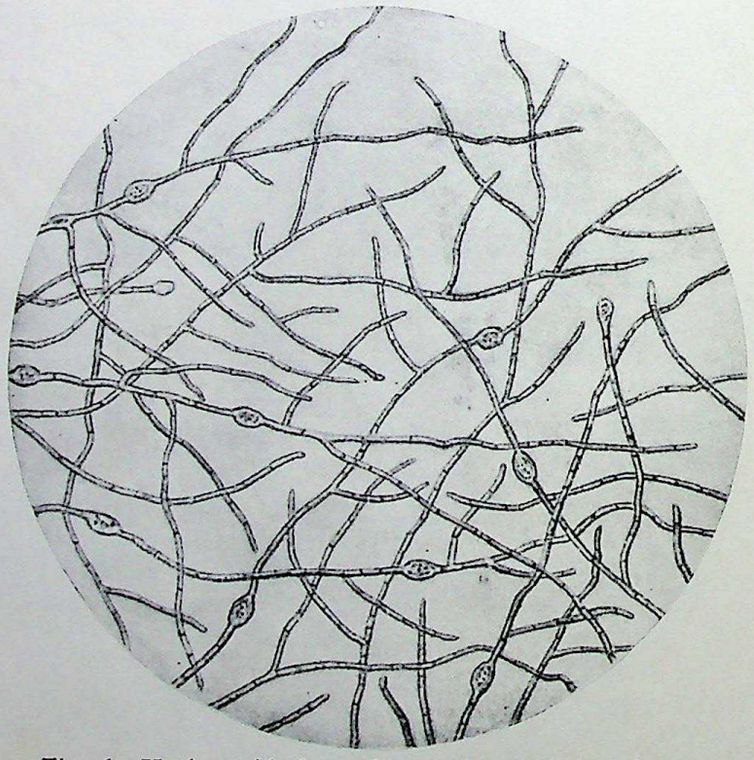


Fig. 6.—Hyphæ with intercalary and end chalamydospores. (1|6th Objective and No. 10 Ocular.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

species or generic character. W ave found from time to time a typical species that only invades the hair, occasionally may ttack the glabrous skin, and conversely we have also found a typical ringworm of the cruris type attack the hair of the head and produce kerion. As both these characteristics, i.e., colour of the growth and site of attack, are variant characters they cannot be significant of generic or species differentiation. We must fall back on the morphological characters and in both these fungi they are the same. We therefore regard the *Trichophyton* under investigation as a variant of *Trichophyton violaceum* and we propose to call this subvariety *indicum*. As far as we are aware, most botanists do not consider colour variations in the flowers of plants to be distinctive enough to create a new species. The description of new species based on variant characters may gratify the personal vanity of some workers in seeing their names attached to species or even genera, but the multiplication of species is a nuisance to the student and teacher in these subjects.

TREATMENT.

At the commencement of our research when we had recognised the condition as a separate clinical entity we had not found out the cause. We thought at first that it was a chronic staphylococcal infection which was aggravated by the cross rub of the *dhotie* or *sari*. Vaccine therapy was given a very extensive trial, the vaccine used being a mixed one containing 1,000 millions of both *Staphylococci*, i.e., *aureus* and *albus* per c.c., and graduated doses were given every third day until a maximum dose of 1 c.c. was attained, and then the intervals between each serial injection was increased to once a week. The net result of this treatment was that the secondary staphylococcus infection was kept under control as long as the immunisation was continued, but the condition became as bad as ever a few weeks after the course was discontinued. Of all the local remedies, the best application was Lotio Calaminæ Extra B.P. which was used as an evaporating lotion and helped to keep down the inflammation and induration. Any strong parasiticidal agent as chrysarobin, etc., only increased the inflammation. When we had recognised the causation of the lesion to be a ringworm fungus, we next tried *x*-rays with very considerable success. We are indebted to Lt.-Col. J. A. Shorten, I.M.S., Honorary Radiologist to the hospital, for details of the technique which he employs in the *x*-ray department. The voltage is a current of 70,000 volts, Coolidge tube with radiator, and a resistance of 3 milliamperes. The distance from the target is 9 inches. Both unfiltered and filtered doses are used depending on the nature of the lesions. On the beard area, neck, usually ½-pastille doses are given, but on the legs a single-pastille dose is usually given. In extensive cases filtered doses are used through a 1-mm. aluminium filter; divided doses of ⅙-pastille doses are given twice weekly for six exposures or two ½-pastille doses at inter ment at all, the average n th all cases an interv the 2,820 treated cases n dapse in order to all on-collapsed) being 48.5 ,e see if a cure has been h a mo ality rate of 91 per rence take place, owing untre d cases. Treating the whole area in e is regretted that r doses should be repeated t importance unfiltered rays. Although the *x*'d and non-nt is very successful in its results, that ber of cases that we were sending to this department put a considerable strain on the apparatus as well as keeping the operator busy from early morning to late in the evening. We are indebted to Lt.-Col. Shorten and Mr. Fleming for all the trouble and care they have expended on the treatment of these cases.

Whilst experimenting on the inhibition of the staphylococcus in obtaining pure cultures of this fungus we noticed the marked inhibitory effect of gentian violet on this fungus. We determined to give this dye a trial in the disease. During the last 18 months we have treated at least 60 cases with very satisfactory results. We used a 5 per cent. solution of gentian violet which is painted on the infected area three times a day; a cure usually takes place in three weeks. Any pustules that are seen round the hair follicles are opened up with a sterile needle, and a drop of the gentian violet lotion dropped into the opened pustule. We have used weaker solutions of the dye, such as 2 per cent., but it was too weak and the cures took longer to occur. The only objection to the treatment is the staining of the skin a deep blue colour; the dye also stains all the clothes in that area. The poorer classes raise no objection to these disadvantages, but with Europeans it means that they have to remain at home or come into hospital for treatment. In some intractable cases, in which the patient gave a history of having tried all the well-known parasiticides such as chrysarobin, during a period of 10 to 15 years without success, we have produced a cure in three weeks by painting the infected area with 5 per cent. gentian violet solution. We now rarely have to send any cases for *x*-ray treatment as the ordinary case is so easily cured by this dye. When there is marked induration round the hair follicles the dye cannot penetrate so deeply into the corium and it is necessary to use *x*-rays for treatment.

CONCLUSIONS.

(1) In India there is an intractable folliculitis attacking the upper part of the hair follicles of the beard area, neck, chest, arms and legs which is known as "cooly itch."

(2) The lesions are more commonly seen in men than women and chiefly amongst the poorest classes.

(3) The infection is due primarily to a ringworm fungus with secondary staphylococcal infection.

(4) The fungus is closely allied to the Achorions in its morphological characters.

(5) It differs slightly in cultural characters, etc., from the species now known as *Trichophyton*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

but not sufficiently to justify its des- [illegible] a separate species.

(6) [illegible] disease can now be cured by the application of a 5 per cent gentian violet solution painted [illegible] the area thrice daily for three weeks.

(7) When marked induration of the corium is present, epilation of the [illegible] rays may be necessary to bring about [illegible]

REFERENCES.

Acton, H. W. and McGuire, C. (1927). Tinea Cruris: Its manifestations, diagnosis and treatment. *Indian Med. Gaz.*, August, p. 419.

Castellani, A. and Chalmers, A. J. (1919). *Manual of Tropical Medicine.*

A NOTE ON THE VALUE OF MEDICINAL TREATMENT IN CHOLERA.

By DR. J. WALKER TOMB, M.A., M.D., D.P.H., O.B.E.,
Asansol Mines Board of Health.

BELOW is given a table (Table I) recording the detailed analysis of the results of treatment by various specified methods in 723 cases of cholera in the Asansol Mining Settlement during the years 1927-28. The remedies commonly employed in the settlement in the treatment of cholera are carminative "cholera mixtures," generally containing chlorodyne or some similar preparation of opium, saline injections, homœopathy, and the essential oils' cholera mixture.

TABLE I.

Detailed analysis of the results of treatment by various methods of 723 cases of cholera in the Asansol Mining Settlement during the years 1927 and 1928.

Treatment.	NOT COLLAPSED before treatment was commenced.			COLLAPSED before treatment was commenced.		
	Cases.	Deaths.	Percentage case mortality.	Cases.	Deaths.	Percentage case mortality.
"Cholera Mixtures" ..	245	45	19·6	263	192	73·0
Saline Injections ..	11	2	18·2	51	24	47·1
Homœopathy	38	5	13·2	30	22	73·3
Essential Oils Mixture ..	41	3	7·3	44	21	47·7
Untreated ..	..	..	..	102	95	93·1

By the term "cholera" here is meant a disease exhibiting the four clinical symptoms of diarrhœa, vomiting, muscular cramps and suppression of urine. In a considerable number of the cases analysed the clinical diagnosis of the disease was supported by bacteriological examination, though this in my opinion is quite unimportant where the four clinical symptoms referred to above are present, more especially in endemic areas and during epidemic times. Cases of vomiting and diarrhœa only ("choleraic diarrhœa") which did not progress to the stage of cramps and suppression of urine are not included in the analysis, even though proved on bacteriological examination to be associated with the *Vibrio cholerœ*. It will be observed that the mortality rate amongst the untreated in this series of cases (Table I) was 93 per cent., a rate which is closely in accord with the average mortality rate of 91 per cent. recorded in Table III of the larger series of 398 untreated cases over the period 1922—28.

From the detailed analysis of treatment submitted in Table I it will be observed that the mortality rate from treatment of non-collapsed cases of the fully established disease with ordinary carminative "cholera mixtures" is approximately 20 per cent., representing a saving of no less than 70 per cent. of lives as compared with untreated cases. Even amongst the cases which were collapsed before treatment with such "cholera mixtures" commenced, it will be seen that the mortality rate was only 73 per cent. compared with a mortality rate of 93 per cent. amongst untreated cases representing a saving of 20 per cent. of lives. The widely prevalent idea that medicinal treatment in cholera is of little or no value is therefore entirely erroneous and cannot be too strongly controverted.

It will be noted with some interest from Table III that homœopathic treatment in cholera is considerably better than no treatment at all, the mortality rate amongst 369 cases (both collapsed and non-collapsed) receiving homœopathic treatment, being 47 per cent. compared with a mortality rate of 91 per cent. in untreated cases. From the detailed analysis in Table I it will be observed that the mortality rate amongst 38 non-collapsed cases receiving homœopathic treatment was 13 per cent. and amongst 30 collapsed cases 73 per cent. This result may be due partly to suggestion—a factor common to all treatment—and partly to the fact that the common homœopathic remedy for cholera in the Mining Settlement consists of spirits of camphor, a valuable antispasmodic and carminative.

The mortality rate (7.3 per cent.) amongst the 41 non-collapsed cases treated with the essential oils' mixture in the series of cases analysed in Table I will be seen to compare most favourably with the mortality rates amongst the non-collapsed cases treated by other measures, and it is of great interest to note that even amongst the 44 cases in this series which were collapsed before treatment with the essential oils' mixture commenced the mortality rate was only 48 per cent.; proving that even in collapsed cases where saline injections are not available, as is so frequently the case in field work, recovery may take place in a considerable percentage of cases with appropriate medicinal treatment. Saline injections are however specifically indicated in all collapsed cases (in conjunction with approved

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

medicinal remedies as now appear) and should be resorted to when available without fail.

TABLE II.

Analysis of the results of treatment of 328 cases of cholera by the essential oils' mixture in the Asansol Mining Settlement during the years 1923 to 1928.

Year.	Not Collapsed before treatment was commenced.			Collapsed before treatment was commenced.		
	Cases.	Deaths.	Percentage case mortality.	Cases.	Deaths.	Percentage case mortality.
1923 ..	60	3	5·0	18	13	72·2
1924 ..	62	3	4·8	49	25	51·0
1925 ..	15	1	6·7	18	12	66·7
1926 ..	12	1	8·3	9	5	55·6
1927 ..	12	1	8·3	12	4	33·3
1928 ..	29	2	6·9	32	17	53·1
TOTAL ..	190	11	5·8	138	76	55·1

In Table II is given a detailed analysis of the results of treatment with the essential oils' mixture of 190 non-collapsed and 138 collapsed cases of cholera over the period 1923—28. In this series of cases, as will be seen from reference to the table, the mortality rate amongst the non-collapsed cases was approximately 6 per cent. and amongst the collapsed cases 55 per cent.

In Table III is given a return showing the mortality rates amongst 2,826 cases receiving some form of treatment in the Asansol Mining Settlement over the period 1922—28, compared with the mortality rate amongst 398 cases during the same period receiving no form of treatment. This table clearly demonstrates the great value of medicinal treatment in cholera as compared with no treatment at all, the average mortality rate amongst the 2,826 treated cases (both collapsed and non-collapsed) being 48.5 per cent. as compared with a mortality rate of 91 per cent. amongst the 398 untreated cases. In connection with this table it is regretted that until the year 1927 the great importance of differentiating between collapsed and non-collapsed cases with a view to estimating the comparative value of various treatments in cholera was not adequately realised.

I publish this note in the hope that it will be of interest to all who have to undertake the "mass" treatment of cholera during widespread epidemics, and that it will induce them to keep similar records of treatment so that the value of the various remedies which may be employed may be accurately and scientifically appraised, and that, as a result, the pernicious and erroneous teaching that medicinal treatment in cholera is useless or even harmful may be effectively and finally disposed of.

It is to be remembered that the results of medicinal treatment here recorded are those of treatment in the "field" without the aid of skilled attendance or any therapeutic refinements. In private practice where such additional aids are utilised the results of medicinal treatment should be still more satisfactory.

TABLE III.

Analysis of the results of treatment of cholera cases by various methods in the Asansol Mining Settlement during the years 1922 to 1928.

Treatment.	1922		1923		1924		1925		1926		1927		1928		TOTAL.		
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Percentage case mortality.
"Cholera Mixtures."	268	128	131	78	236	152	86	36	624	347	177	68	331	172	1,853	981	52 9
Saline Injections ..	25	11	29	10	47	33	27	13	86	37	14	5	48	21	276	130	47·1
Homœopathy ..	15	3	56	31	67	32	27	11	136	69	47	16	21	11	369	173	47·0
Essential Oils' Mixture.	..	..	78	16	111	28	33	13	21	6	24	5	61	19	328	87	26·5
Total number of treated cases.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,826	1,371	48·5
Untreated ..	39	26	50	48	74	72	21	16	112	105	26	26	76	69	398	362	91 0

NOTES ON THE VALUE OF THE SEDIMENTATION TEST IN THE TREATMENT OF LEPROSY.

By MRS. ISABEL KERR, M.B., CH.B.,
Victoria Leprosy Hospital, Dichpali, Nizam's Dominions.

I HAVE been able to apply this test in the treatment of 120 cases of leprosy in this hospital and have found it so useful that I venture to think that its benefits are worth recording. The subject has already been fully worked out by Dr. E. Muir in a recent issue of the *Indian Journal of Medical Research*. The methods adopted are

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

those suggested by him. The technique is so extremely simple that if necessary a large number of tests can be carried out daily with very little trouble. The pipettes used are those supplied specifically for this test by the Bengal Scientific Supply Co. From the time of the transference of the blood and sodium citrate mixture to the pipettes, the readings are checked after 2 and 3 hours and an average of the two taken as the result.

Sedimentation rate—an indication of the amount of infection.

Patients suffering from uncomplicated nerve leprosy register an index of 10 to 20, which is similar to that found in healthy people. It is in skin leprosy, however, that the test is most useful, since by it we can gauge the amount of infection in the tissues apart from treatment, as well as check therapeutic changes. For example, if the lepra bacilli are few and difficult to find in large numbers in the skin, the sedimentation rate will be nearly normal, perhaps as low as 22. Again if they are plentiful, such as one finds in a nodulated skin, the sedimentation index may rise as high as 70 or 80, while between these extremes we get all sorts of variations. Also the case that registers say 28, previous to a dose of a reaction-producing drug like potassium iodide, may twelve hours after administration, register 33 or 35—thereby showing the effect of this drug. As clinical symptoms may or may not accompany this reaction, the change in the sedimentation rate of the blood corpuscles may be the only indication that a patient is reacting to potassium iodide at all.

As a guide to methods of treatment.

It is unwise to take anything for granted if one wishes to utilise potassium iodide in the treatment of leprosy. It is advisable therefore to take the sedimentation rate of every patient on admission and so avoid errors at the start. If previous to treatment the rate is low, say 20 to 28, we know that the resistance is good and that it will be safe to begin by using potassium iodide along with hydnocarpus preparations. In all probability the type of infection will not be acute and we can try to root out foci of the disease—always presupposing a careful and regular check on the sedimentation rate before and after the administration of potassium iodide.

Should the rate be high, 40 or more, resistance is poor and quite another method has to be followed. Most likely the lepra bacilli are accessible. Under such conditions a potent drug like potassium iodide would do a great deal of harm unless given in infinitesimal doses. A patient may look as if he could take 5 grains of potassium iodide and yet not be able to stand a fifth of that dosage. In such cases it is better to commence treatment with tonics and sodium hydnocarpate and afterwards, when resistance has developed, to give stronger preparations like iodide. But a good idea of the resistance of the patient can often be gained by the blood sedimentation test. As resistance increases, the rate falls.

A knowledge, therefore, of the sedimentation rate enables us to sum up the severity of the infection in relation to the patient. It is sometimes a safer guide than even the bacteriological examination. If the latter is returned as negative and, after excluding complications, the rate is 28, we know that there are lepra bacilli in the tissues since, if they were absent, the rate would register between 10 and 20. If the sedimentation rate is high, say 47, and the patient has only a hyperpigmented area on his face with nose and skin positive, we know that he has a severe infection and treatment must be given carefully. Without such a guide as this test, it seems to me that it is difficult to decide correctly on methods of treatment in those cases.

As a guide during treatment.

It is well to test the sedimentation rate as often as possible during treatment, but it is specially useful to do so before and after the administration of potassium iodide, and so ascertain the non-reaction and reaction indices respectively. It is difficult to say which of these indices is the more important. At all events it is essential before each dose of potassium iodide to get back to the irreducible minimum of the non-reaction index. If this is not secured, the maximum resistance of the patient will not be resumed and one reaction will be grafted on top of another. This naturally brings difficulty in treatment as the patient's condition will be out of hand.

The clinical symptoms of a leprous reaction, namely, temperature, erythema, rose-coloured nodules, etc., ought to disappear within two or three days from the time of their appearance. But this is no proof that the reaction itself has come to an end. According to the sedimentation test it may continue after these symptoms have declined. For example, if the case is complicated it may be a week before the rate returns to the patient's non-reaction index; and yet he will maintain that he feels quite fit. Any one with small experience of skin leprosy will recognise how important such knowledge is. Without it, one sees patients becoming weak under iodide and severe types of the disease (e.g., lung infections) resulting.

Sometimes we have cases with a fairly high sedimentation rate, say 40 to 50, in whom the disease is very encysted in the tissues and difficult to reach. The lesions in such are raised, with a good deal of interstitial thickening, and more or less erythematous. Such may go on taking iodide till full doses are reached and continue doing so for some weeks. Then all at once they become "sensitized." If this sensitization is not detected by the sedimentation rate before it goes on to clinical symptoms of reaction, one is likely again to have a condition which is difficult to cope with.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The cases, however, which on the whole have benefited most by potassium iodide here, have been those which previously by oil treatment had had their resistance raised to the maximum.

Influence of hydnocarpus preparations on the sedimentation rate.

By the sedimentation test the hydnocarpus preparations reveal their two-fold therapeutic action, namely, that of autovaccination and their tonic effect. The former is shown by a rise in the sedimentation rate and may be accompanied by skin symptoms and temperature—all of which pass off in the usual way. It is almost needless to say that so long as this reaction is produced by the oil, it is hardly necessary to add potassium iodide to the treatment although, among the 120 cases dealt with in these notes, there is one patient who shows distinct idiosyncracy to oil and takes potassum iodide very well.

As resistance increases this reaction effect of the oils passes off and their tonic effect only is manifested. At this stage the oil is a valuable agent in helping to bring down the sedimentation rate when it has been raised by iodide or by any other cause. It may require several doses to attain this, but the non-reaction index will ultimately be resumed—always excepting complicating factors which must be dealt with separately.

Other influence on the sedimentation rate.

Bile—present in the blood of 5 per cent. of these cases, so retarded the rate of sedimentation that the indices were lowered by 20 to 25 points. In such cases iodism may occur whereas ordinarily this is a condition about which few complaints are made.

Starvation accelerates the sedimentation rate and is accompanied by marked leucocytosis. A small boy with a leprotic nerve only had a rate of 44 on admission. He was very wasted and came to us from famine conditions. The same thing was evidenced in a Brahmin patient who had fasted for two years after he found he was suffering from leprosy.

Malaria raises the sedimentation rate so much that a nerve leprosy will leap up from 16 to 64 or more and continue high for some time after the temperature has gone. When resistance is lowered to this extent one can understand how readily malaria provides the conditions in which the *Mycobacterium lepræ* can best flourish. In a patient whose resistance is already poor the effects of malaria constitute a serious problem, especially if the temperature is allowed to remain high for any length of time.

Syphilis and the sedimentation rate.

The sedimentation rate in leprosy when this disease is complicated by syphilis cannot be fully dealt with in these notes. As we know, syphilis reduces resistance and is possibly one of the most important factors in the etiology of leprosy. As a rule mercury when administered by the mouth aggravates the disease and further raises a sedimentation rate which is already high. This is especially so in skin cases who have had no treatment. Among those who have had specific anti-leprotic treatment as well as courses of Hg. 33 and N.A.B. one finds a certain percentage who benefit by mercury when given by the mouth. Among my 120 cases, in eighteen the Kahn test was highly positive. Two of these, who had just been admitted and had had no previous treatment of any kind, could not take mercury orally at all. Their leprosy flared up immediately. As to the others, the sedimentation rate was taken and mercury given orally to the point of mercurialism. This was treated and the patients left for 14 days, when the rate was again checked. In 10 there was no improvement evidenced by the sedimentation rate. In fact in some of them it had risen and when it fell later the former non-reaction index was maintained. The remaining 6, however, showed improvement. The rate had fallen in each.

Case A	previous to	Hg.	S.R.	27	fell to	22
Case B	,,	,,	,,	36	,,	28.5
Case C	,,	,,	,,	55	,,	37
Case D	,,	,,	,,	36	,,	26
Case E	,,	,,	,,	33	,,	27.5
Case F	,,	,,	,,	52	,,	35.5

This would show that in syphilis complicating leprosy, one might give mercury by the mouth provided a close watch was kept on the sedimentation rate from day to day—deleting those patients who show a rise and pushing the dose in those who improve. No risks are run and the patients have a chance of receiving all possible help.

Conclusion.

From the above notes it should be evident that in the sedimentation test we have a means of controlling treatment hitherto unavailable; and we have learned that in anti-leprous treatment there are limitations which this test reveals and which cannot be ignored. It repays one to study the relative resistance of each individual patient, and even if our treatment appears slow, on no account must this resistance be impinged upon.

NOTES FOR STAFF ENGAGED ON ANTI-MALARIAL WORK.

By W. D. SPEEDY, M.B., B.Ch. (T.C.D.),
Medical Officer, Raipur-Vizianagram Construction, Bengal Nagpur Railway.

HIS experience of some twelve months as Medical Officer on the Raipur-Vizianagram Construction of the Bengal Nagpur Railway, has led the writer to publish these short notes, written for the benefit of his staff, in the hope that they may prove of help to others, who like himself are engaged on anti-malarial work.

He has been impressed more than ever by the havoc which malaria, uncontrolled by modern "protection" and medicine, makes with the inhabitants of a hyperendemic area, and feels that

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

no propaganda on the subject is wasted. The circular, a reproduction of which is seen below, has for this reason been distributed in addition to the Engineering Officers on the Construction, who have always given the greatest help and without whose co-operation the work would be impossible.

It is obviously desirable that the closest liaison between engineering and medical staffs be observed in the construction of important lines, more especially when these lead through country where malaria and other diseases exact a heavy toll from the labour employed. The medical man learns much from the engineer which is of practical value in this work, and is in turn able to assist the latter to avoid particularly deadly places when labour camps have to be selected, and it is hoped influences him to leave less of a legacy of malaria to the district in which he works.

No claim to originality is made. The system of "protected camps" is that devised by the malariologist of the line, R. Senior White, F.R.S.E., while the sketches accompanying the notes* are adapted from those issued at a very pleasant and instructive malaria class held at Saharanpur in October 1926, under Major G. Covell, M.D., I.M.S., of the Central Malaria Bureau.

Technical terms have been avoided as far as possible as the object of the notes is to provide an efficacious working minimum for the Assistant Malarial Inspectors or Sub-Assistant Surgeons employed who may have little or no special training when taking up the work.

In advising the weekly oiling of camps, the advice of an eminent orthopædic surgeon has been recalled. "Gentlemen, always overcorrect for deformities."

A somewhat egoistical reference to the railway to which I have the honour to belong, may be pardoned. Its inclusion has at heart the fostering of "esprit de corps" without which no unit, military or civil, may hope for any achievement worthy of note.

The "C. M. I." referred to in the text is the Chief Malarial Inspector, a trained man, whose duty it is to inspect and advise regarding the practical side of the work, cutting of drains, oiling, etc.

My thanks are due to J. A. Parker, B.Sc., A.M.I.C.E., District Engineer of Jeypore Plateau Survey, and Dr. A. Adhikari, my assistant, for helpful criticism.

Notes for Staff engaged on Anti-Malarial Work.

What is protection? It is a very definite and valuable kind of 'Preventive medical work.'

What is its value? It enables us to prevent malaria and other diseases carried by mosquitoes, by striking at these insects in their vulnerable stage.

It directly prevents much sickness, and in so doing saves for the Railway many hours and days which would otherwise be lost.

How is it carried out? Firstly by choosing camps in as healthy a place as possible, taking into consideration the work for which the camp is needed.

Secondly by preparing the ground in and around this camp within the half-mile radius so that all dangerous water is either drained away, or when this is not possible, treated with oil, etc., to render the breeding of mosquitoes impossible.

How does the mosquito grow? Starting life as an egg laid on the water, in favourable circumstances it hatches out as a larva in from two to four days. It lives as this 'wriggler' for a week or so before changing into a comma-shaped 'pupa,' from which within 24 to 48 hours the perfect insect emerges and flies away.

How does this life history affect your work? If the mosquito passes the pupal stage and gets on the wing, your work has been for nothing. *It must be destroyed before it grows its wings*, and remember that in various places this whole cycle may take place within a week, so that if you fail to treat *every collection of water shown on your plan every seventh day*, you are responsible for a flight of mosquitoes which may cause an outbreak of fever in the camp, for which *you* are responsible.

How will you protect a camp? 1. First walk all round it in gradually increasing circles from the centre until you reach the half-mile circle. *Learn every inch of the ground.* A small missed spring or collection of water may breed enough dangerous mosquitoes to wreck your whole work.

2. Your 'protection plan' will show as far as possible all dangerous places requiring treatment, but every camp is in a constant state of change as a result of rain, diversion of nullahs, etc., and *you must use initiative* in dealing with new breeding places. The C.M.I. will give you advice and directions on his inspections but always *act at once.* You will learn gradually the best measures to adopt in each case.

3. From 1 and 2 above you will have learned where mosquitoes are breeding, and your work is now to prevent this by drainage and treatment of water.

What types of water are dangerous?

Always.	*Sometimes.*
Grassy edged streams.	Hoof marks.
Streams in ravines.	Wells.
Hill foot seepages.	Borrow-pits.
Running swamps.	Tanks.
Cracks and holes in black cotton soil.	
Springs among rocks.	

Large streams and rivers may need treatment, and rice fields at times breed malarial mosquitoes but cannot be treated without special permission.

You will learn from the C.M.I. on the ground the best type of drain for each kind of water.

How will you treat water that cannot be drained?

1. In streams, pits, ravines, etc., by first having all grass, branches, leaves, etc., cleared from the edges and spraying with crude oil in which a small proportion of kerosine and cresol is generally mixed, or by fixing swabs soaked in oil upstream.

2. In ponds and standing water you will sometimes use cresol, mixed with the water in sufficient quantities to produce a milky tinge. (Do not use unless directed by the C.M.I.)

3. In swamps, paddy, etc., you will use Paris green mixed with dust.

How does oil kill larvæ and pupæ? By clogging up the breathing pores in the insect's body. If you leave grass, branches, etc., in the water you break the oil film and leave 'breathing holes' in the water, so that many larvæ, etc., escape destruction.

What about cresol? This is a definite poison and kills not only larvæ and pupæ but animals and man if used in sufficient strength; hence, the necessity for its careful use.

And Paris green? It is a form of arsenic, does not dissolve in the water but is swallowed by the *larvæ only* to whom it appears as food. It is useless for killing pupæ as they do not feed at this stage of their life.

Note.—Your work will chiefly consist in seeing that the coolies with whom you are provided do the cleaning and oiling work, ***every week without fail.***

* Not published.—(EDITOR, *I. M. G.*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

If you have on occasions to get into a swamp, *do so*. Better men have been there before you.

Learn all you can about the work. Anti-malarial work is just beginning in India and vacancies will exist for men with experience in this Department.

The Bengal Nagpur Railway as usual is first away, and many other railways will follow.

Only men who are keen and conscientious are of any use in the Department. If you are not prepared to work to really stop malaria, you are not required.

A NOTE ON THE ANOPHELINE FAUNA OF A SMALL TANK THROUGHOUT THE YEAR.

By E. S. FEEGRADE,

Military Assistant Surgeon,

The Harcourt Butler Institute of Public Health, Rangoon.

OBSERVATIONS on the tank immediately west of the Harcourt Butler Institute of Public Health for the determination of the species of anopheline mosquitoes breeding therein were spread over a period from January to December in 1927.

The tank is a small one, roughly about 50 yards square, with banks sloped at 45°,—well covered with grass and lined with large trees on all sides, —those on the west being close to the water's edge with overhanging branches which shade the water in the afternoon.

The character of the edges and surface of the water are different at different periods of the year. From January to May (practically the dry months of the year) the edges were free from grass encroachment and the surface was covered with red and green algæ which appeared late in January and gradually invaded the whole surface, thereby producing a mixed colouring of red and green. This growth moved about with the wind, leaving parts of the water-surface clear. At the onset of the monsoon in May the film thus formed by algæ broke up, and after a few showers disappeared entirely. Soon after the first fall of rain, grass invaded the edges of the tank and remained thus throughout the monsoon period and until the end of the year. Besides this grass invasion, three or four species of aquatic plants appeared and flourished concurrently providing suitable protection for the breeding of anopheline mosquitoes.

In the hot dry months of March and April, the water diminished considerably and a noticeable feature associated with this decrease was the abundance of prawns;—these crustaceæ are present throughout the year but not in such numbers as are found in the coldest and hottest seasons. Anopheline larvæ were not destroyed by these prawns experimentally and I assume that neither are they in nature. In addition to the presence of prawns, tadpoles and fish abounded, though the former existed in this form for only a short while before they metamorphosed into frogs; thus they were found in large numbers at the edges of the tank in the latter half of May, but by June forsook the edges of the water for the grassy parts nearby. Prawns were found throughout the year and consisted of the following species:—

1. *Esomus ahli* Hora.
2. *Barbus puntius sophore* (H. B.).
3. *Ctenogobius alcocki* (Annan).
4. *Macrones gulio* (H. B.).

The first three species were collected in the deeper parts and the fourth near the edges. All four species were found to destroy larvæ under laboratory conditions.

The pH value of the water varied from 7.2 to 7.8. The alkalinity increased from January, rising gradually until 7.8 was recorded in May before the first heavy fall of rain. The pH value dropped to 7.2 with the first big fall of rain and alternated between 7.2 and 7.4 throughout the wet season, whereas a long interval without rain occasioned a higher alkalinity.

The anopheline fauna consisted of:—

A. fuliginosus Giles.
A. hyrcanus var. *nigerrimus* Giles.
A. barbirostris Van der Wulp.
A. vagus Donitz.

A. fuliginosus.—This is an interesting species, because of its reputation as a common carrier in the plains of Burma, and in this case it was found breeding in small numbers along the grassy edges of the tank in January. As the water decreased there was no corresponding grassy encroachment, and with the appearance of the red and green algæ, the larvæ of this species also had decreased considerably by the end of the month until none were obtainable. They were not seen again until early in June when they were collected in large numbers where grass and other aquatic plants were invading the edges and when the pH of the water fluctuated between 7.2 and 7.4. Throughout the wet season from June to October, and also from November to January they were found breeding in the tank,—the former period being that in which they were most prevalent.

A. hyrcanus var. *nigerrimus* and *A. barbirostris* bred in the same season as *A. fuliginosus*, but in much smaller numbers in the early and middle parts of the rains and in larger numbers at the end of the monsoon. These species decreased in January and later were not obtainable.

The finding of *A. vagus* in a tank is an unusual feature, but they were found on only a single occasion.

A. fuliginosus is a known transmitter of malaria both in India and Burma, in which latter country it is common, but although it bred in such large numbers it is an interesting fact that there was no evidence of its producing malaria in this neighbourhood. What are the reasons for this? The chief one is, I think, that they have not become infected by feeding on human carriers, for the majority of residents in the vicinity of the tank are more or less permanent inhabitants and have not been exposed

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to infection by travelling in infected areas. It would be interesting to get this species experimentally infected to ascertain if they could transmit the disease to an uninfected individual. For if the parasite does not grow in the species of mosquito which breeds in this tank, well and good; but if they do—yet cannot transmit the parasite to man—it may throw some light on the fact that there are certain species which, although they transmit malaria in some places, do not do so in others, even though they feed on infected men.

In conclusion I wish to place on record that, during my absence in the rainy season, these observations were partly carried but by Sub-Assistant Surgeon, U. Tin, to whom I am indebted for his collaboration.

EXPERIMENTS WITH ISOTEX AS A LARVICIDE.

By E. S. FEEGRADE,

Military Assistant Surgeon, The Harcourt Butler Institute of Public Health, Rangoon.

"ISOTEX," a proprietary preparation of the Chemical Company of New York, 49 Broadway, New York, is reputed to destroy pests which breed in and inhabit swamps, polluted pools, garbage, and waste dumps.

It is a dark brown fluid, forming a thick film on the surface of water, adheres to any surface, even glass, stains clothes, and is stated by the manufacturers to be poisonous.

Experiments were conducted with anophelines and culicines both in the laboratory at the Harcourt Butler Institute of Public Health and in their natural breeding-places.

The final conclusion of the laboratory experiments was that the minimum quantity of Isotex required to kill specimens of both subfamilies of larvæ within 1 hour was 1 c.c. spread on 3,000 c.c. of tap water with a surface area of $8\frac{1}{2}$ inches $\times$ $3\frac{1}{2}$ inches and a depth of $6\frac{1}{2}$ inches, even though the film did not cover the entire surface of water.

Younger larvæ were killed off early, even within 5 minutes, but the mature ones within the time already stated. Larvæ, young and old alike, which came in contact with the solution when the latter was being poured onto the surface, died almost immediately.

Thereafter with the same apparatus and the same quantities of fluid as above, but with cut grass added to the surface of the water, the death of the larvæ was delayed to a maximum period of 75 minutes.

Under similar conditions fish of the species of *Haplochilus panchax*—a surface breeder—were killed in 10 to 15 minutes.

In experimenting in natural breeding-places, pools and drains were considered to be most suited for the purpose. The pools selected measured approximately 6 feet broad, 12 feet long, and 2 feet deep at their deepest part. At the margins where it was 1 to 2 feet deep there was much aquatic vegetation, sheltering larvæ of anophelines, culicines, pond skaters, spiders, water beetles, and *Haplochilus panchax*. Here 30 c.c. of Isotex was the minimum quantity found to destroy all aquatic life in 75 minutes.

Experiments were next carried out in sections of a drain, 15 feet long, 5 feet wide, and $2\frac{1}{2}$ feet deep, with much aquatic growth along both edges, and with a clear space of about a foot in its middle. In this case larvæ and other aquatic fauna—such as were noted in the case of the pools—required 60 c.c. of Isotex to destroy them in 45 minutes as they were unable to escape because of the thick aquatic vegetation.

Isotex is a powerful larvicide, but it is also fatal to fish, and for this latter reason I do not consider it suitable for use in anti-malarial measures.

A SIMPLE METHOD FOR THE ESTIMATION OF BLOOD UREA APPLICABLE AT THE BEDSIDE.

By HARENDRA NATH MUKHERJEE, B.SC., M.B., D.I.C. (Lond.),

Biochemical Department, Carmichael Medical College, Belgachia, Calcutta.

OF the many biochemical tests done on the blood for clinical purposes, the estimation of blood urea is one of the most important. This is indicated in nephritis, uræmia, enlarged prostate, obstruction to the urinary flow, and various other conditions and throws considerable light on the condition of the patient. In normal healthy Bengalees it is rare to find a blood urea-nitrogen value greater than 14 mg. per 100 c.c. of the blood. In uræmia, and in other conditions with impaired kidney function, notably in cholera—it is greatly increased. Values as great as 100 mg. per 100 c.c. of blood may be met with in these conditions and indicate a very bad prognosis.

There are many excellent methods for the estimation of the blood urea, but as they require considerable laboratory facilities and apparatus, they are not suitable for patients in the remote mofussil. In the present paper a very simple method for estimating the blood urea is given which can be easily performed in the mofussil or even at the bedside. The results obtained are quite reliable for clinical purposes.

This method is based on the method of Fosse, Robyn and François (1914) by which urea is precipitated as dixanthydryl urea by the addition of an alcoholic solution of xanthydrol. Nicloux and Welter (1921) found the xanthydrol method to be very reliable even with very small quantities of urea. Recently Beattie (1928) and also Luck (1928) independently have described methods for estimation of blood urea by means of xanthydrol. Beattie has estimated the dixanthydrol urea formed colorimetrically by dissolving the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

precipitate (after removal of the excess of xanthydrol by washing with methyl alcohol), in sulphuric acid (50 per cent. by volume) in which xanthydrol and its compounds dissolve producing an intense yellow colour. She has filtered off the precipitate of dixanthydryl urea by suction through a Gooch crucible packed with asbestos. The precipitate was then thoroughly washed with methyl alcohol, preferably saturated with dixanthydryl urea, and then dissolved in 50 per cent. sulphuric acid for colorimetric estimation against a standard.

Luck has utilized the property of dixanthydryl urea to be readily oxidised as the basis of a quantitative method. The precipitate of dixanthydryl urea is dissolved in 50 per cent. sulphuric acid, producing the characteristic yellow colour, and is then oxidised by means of potassium permanganate quantitatively, when the colour is discharged. The end point is quite sharp. The method described in the present paper is a clinical method and utilises the fact that while the excess of xanthydrol remains in solution in acetic acid, the precipitate of dixanthydryl urea forms a cloudiness or turbidity proportional to the quantity of precipitate formed when the precipitate is suspended by shaking. It is thus possible to estimate the quantity of urea directly and fairly accurately for clinical purposes by comparison with the turbidity produced by solutions of urea of known strengths when similarly treated with xanthydrol.

Reagents and Apparatus.

(1) Folin and Wu's deproteinising reagents:—2|3 N sulphuric acid; 10 per cent. sodium tungstate solution and distilled water.

(2) Standard solution of urea in water:—28 mg. of urea N (i.e., 60 mg. of urea) per 100 c.c. Add a little xylene as a preservative.

(3) Glacial acetic acid.

(4) Five per cent. solution of xanthydrol in methyl alcohol.

(5) Test tubes of uniform size and make in a rack; one 15-c.c. Folin's pipette;* one 1-c.c. pipette graduated into 1|10ths c.c.; one 2-c.c. pipette; filter papers; glass funnel; one 25-c.c. graduated cylinder.

(6) Potassium oxalate crystals.

*This 15-c.c. pipette is not essential.

ESTIMATION OF BLOOD UREA.

0.5 to 1 c.c. of blood is drawn from the patient and oxalated to prevent co-agulation. The blood is then deproteinised by the method of Folin and Wu. To one volume of blood is added 7 vols. of water, 1 vol. of 2|3 N sulphuric acid and 1 vol. of 10 per cent. sodium tungstate solution. Shake and filter on a dry filter.

Arrange a series of test tubes, 14 in number, of uniform size and make in a test tube rack. Mark the test tubes according to order as 1, 2, 3, 4, 5,.....14.

In the test tube No. 14 take 2 c.c. of the blood filtrate (= 0.2 c.c. of blood). Prepare a solution of tungstic acid by mixing 3 c.c. of 2|3 N sulphuric acid with 3 c.c. of 10 per cent. sodium tungstate solution and then adding 21 c.c. of distilled water to make up to a volume of 27 c.c. To the test tubes in the rack add the reagents as mentioned below:

TABLE I.

Test tube number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Standard urea solution; in c.c.	0·8	0·6	0·4	0·3	0·25	0·2	0·15	0·13	0·1	0·08	0·05	0·03	0	0
Tungstic acid solution; in c.c.	1·2	1·4	1·6	1·7	1·75	1·8	1·85	1·87	1·9	1·92	1·95	1·97	2·0	2·0 of blood filtrate only
Glacial acetic acid; in c.c.	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0
Amount of urea N; in mgm.	0·224	0·168	0·112	0·084	0·07	0·056	0·042	0·036	0·028	0·022	0·014	0·008	0	Unknown.

Mix. To each of the test tubes from 1 to 14 add 0.4 c.c. of 5 per cent. xanthydrol solution in methyl alcohol.

Let it stand for 5 minutes. Then stir the contents of each test tube with a glass rod. Wait for 45 minutes. The test tubes are then shaken to suspend the precipitate formed. The density of turbidity in each test tube is proportional to the quantity of dixanthydryl urea formed and this in turn depends on the amount of urea present.

Calculation.—2 c.c. of the blood filtrate corresponds to 0.2 c.c. of blood (i.e., a dilution of 1 in 10). With the addition of an equal volume of acetic acid we have a dilution of 1 in 20.

Let us assume that the examined sample of blood filtrate matches exactly the test tube No. 6 of the standard set. Then the concentration of urea is the same in the two test tubes.

Now the concentration of urea in this test tube (No. 6), is 0.056 mg. of urea N in 4 c.c.; i.e., 1.4 mg. per 100 c.c. Since in dealing with the blood filtrate we are really dealing with a 1 in 20 dilution of the blood, the value for urea N is 20 multiplied by 1.4 mg., i.e., 28 mg. per 100 c.c. of blood.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

For simplicity to get the value of urea N, simply refer to the following table:—

TABLE II.

	Urea N per 100 c.c. of blood.
Unknown matches with Standard No. 1	112 mg.
" " " " " 2	84 mg.
" " " " " 3	56 mg.
" " " " " 4	42 mg.
" " " " " 5	35 mg.
" " " " " 6	28 mg.
" " " " " 7	21 mg.
" " " " " 8	18 mg.
" " " " " 9	14 mg.
" " " " " 10	11 mg.
" " " " " 11	7 mg.
" " " " " 12	4 mg.

Example:—Unknown matches exactly with test tube No. 9 of the standard set. Then refer to the urea N value corresponding to No. 9 test tube which is 14 mg. of urea N per 100 c.c. of blood.

When the turbidity does not exactly match with any particular test tube, for example when it appears to be greater than one and less than the preceding one in the series, the mean value should be taken.

Laboratory Methods.—In this connection it may be mentioned that we have estimated the blood urea colorimetrically by dissolving the precipitate of dixanthydryl urea in 50 per cent. sulphuric acid as advocated by Beattie. Instead of washing the precipitate in a Gooch crucible, we have removed the excess of xanthydrol by centrifuging as done by Luck. The supernatant fluid is decanted off. The precipitate is then washed with methyl alcohol preferably saturated with dixanthydryl urea,—centrifuged again and the supernatant fluid is again decanted off.

The precipitate is finally dissolved in 50 per cent. sulphuric acid with the production of the characteristic yellow colour. The urea is then estimated colorimetrically.

We have estimated the urea in the same blood filtrate by (*i*) the urease method (according to Folin and Wu, using urease paper and distillation but finally titration), (*ii*) by the colorimetric method as above described, and (*iii*) by the present method, and we have found the present method to be quite reliable for clinical purposes.

As this method requires practically no special apparatus and the estimations can be done within one hour, it is hoped that the method will be of some service to the medical profession especially in remote and far off places.

Instead of matching the turbidity the precipitate can be allowed to settle and the bulk of the precipitate formed can be compared for urea estimation—a procedure similar to that adopted in the estimation of albumin in urine.

Summary.—A simple reliable blood urea method, suitable for use in remote places or even at the bedside, is described.

The advantages of this method are:—

(1) No special apparatus is necessary.

(2) The reagents used are quite stable and can be easily prepared.

(3) The results obtained are quite reliable for clinical purposes.

My best thanks are due to Dr. J. C. Saha, B.Sc., M.B., for helping me to carry out the check experiments.

Results obtained by the present method* for solutions of urea of known value and blood urea N values obtained by this method compared to values obtained by the urease—distillation-titration method are given below:—

Blood filtrates. (Hospital cases):	Present method:	Urease method:
1	5.5 mg.	5.5 mg.
2	16.0 mg.	16.8 mg.
3	31.5 mg.	30.8 mg.
4	5.5 mg.	5.6 mg.
5	9.0 mg.	8.4 mg.
6	163.0 mg.	159.6 mg.
7	70.0 mg.	64.4 mg.
8	24.5 mg.	27.6 mg.
9	14.0 mg.	15.1 mg.
10	28.0 mg.	28.0 mg.
Urea Solutions.†	Present method.	Known value.
1	31.5 mg.	28.0 mg.
2	42.0 mg.	42.0 mg.
3	14.0 mg.	14.0 mg.
4	7.0 mg.	7.0 mg.
5	19.5 mg.	21.0 mg.
6	28.0 mg.	28.0 mg.
7	14.0 mg.	14.0 mg.
8	9.0 mg.	8.4 mg.
9	49.0 mg.	50.4 mg.
10	56.0 mg.	61.6 mg.

REFERENCES.

Beattie (1928). *Biochem. Journ.*, XXII, 711.

Folin (1925). *Laboratory Manual of Biological Chemistry.*

Fosse, Robyn and François (1914). *Compt. Rend. Acad. des Sciences*, p. 367; quoted by Beattie, and by Luck.

* Standards of intermediate values may be interpolated between standards No. 1 and 2; 2 and 3; and 3 and 4 for more accurate results. In cases of blood urea values greater than 112 mg. per 100 c.c. of blood, dilute the suspension by adding carefully a measured quantity of solution (11 c.c. of which consists of 5 c.c. of tungstic acid solution, 5 c.c. of glacial acetic acid, and 1 c.c. of 5 per cent. xanthydrol solution in methyl alcohol) till the suspension will match as regards turbidity with the standard (Mukherjee, 1929). The diluting solution may be saturated with dixanthdryl urea.

The blood urea value is calculated from the dilution or total volume of the unknown.

Example:—Unknown (Original volume = 4.4 c.c.) had to be diluted to a volume of 6.4 c.c. by the addition of 2 c.c. of the diluting fluid to match exactly with standard No. 1. The blood urea N $= \frac{6.4}{4.4} \times 112$ mg. per 100 c.c. of blood = 163 mg. per 100 c.c. of blood.

† Solutions of urea in tungstic acid solution mentioned above.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Luck (1928). *Journ. Biol. Chem.*, LXXIX, 211.
Mukherjee (1929). *Calcutta Med. Journ.*, January.
Nicloux and Welter (1921). *Compt. Rend. Acad. des Sciences*, p. 1490; quoted by Beattie.

RESULTS OF EXPERIMENTS WITH CRUDE OIL PRODUCTS OF THE BURMA OIL CO., LTD., RANGOON, AS LARVICIDE.

By E. S. FEEGRADE,

Military Assistant Surgeon, The Harcourt Butler Institute of Public Health, Rangoon.

"BAUXITE extract," "Distillate Fuel," and "Victoria kerosene"—all proprietary preparations of The Burma Oil Co.—were the subjects of laboratory experiments to ascertain their anti-larval properties and as to which of the three products was most effective in the smallest quantity when spread over a measured surface of water. They were employed side by side with controls.

Larvæ of *Aëdes argenteus* were the only species obtainable in the numbers necessary for this experiment, and large ones of equal size were usually chosen.

After a series of experiments had been conducted, it was noted that—with a measured quantity of each of the products—the results varied on different days, although the conditions of the experiments were apparently exactly similar in every instance. Eventually it was discovered that the varying results were relative to the varying room temperature. Thus a high room temperature of 90°F. and above diminished the quantities of oil by evaporation and the anti-larval action decreased correspondingly, whereas a lower temperature gave better results in shorter periods.

The ultimate findings as to the minimum amount of each oil-product required to destroy *Aëdes argenteus* larvæ were based on experiments carried out with 1,760 c.c. of tap-water, with a surface measurement of 6½ inches by 3½ inches and 4 inches deep, and a temperature varying from 85°—88°F. from 10 a.m. to 3 p.m. In this case the addition of 0.1 c.c. of "Victoria kerosene" killed the first larva in 40 minutes, and the last of 10 in 3 hours and 20 minutes; whereas with the same quantity of "Distillate Fuel" the first larva died in 30 minutes and the last after one and half hours; and with "Bauxite extract" the first larva succumbed in 20 minutes and the last after one hour and 10 minutes.

Smaller quantities than 0.1 c.c. of any of these three products gave unsatisfactory results, destroying some larvæ in longer periods, but not affecting others for three or four days, whilst in some instances pupation occurred.

Hence "Bauxite extract" stands first in the order of efficiency, then "Distillate fuel," and lastly "Victoria kerosene."

Further observations regarding the relation of temperature to experiments on such lines are necessary in order to arrive at more definite conclusions, so I propose to undertake these later on in the coldest and hottest seasons in Rangoon.

A Mirror of Hospital Practice.

A CASE OF MEDICO-LEGAL INTEREST.

By M. UMAR,

Bijnor, U. P.

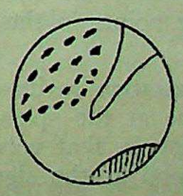
A MAN from Kiratpur, district Bijnor, Bania by caste, was sent by the court for examination of his injuries on 13th February, 1929. He said that he was hit with a *lathi* (stick) on Monday, 11th February, 1929, afternoon. He had the following injuries:—

(1) A contusion six inches long and one inch wide just behind the right ear.

(2) A contusion over the upper part of the left arm eight inches long and two inches wide.

These injuries at the first glance appeared to be trifling. However, he further stated that blood came out of his right ear, nostril and mouth, and that he became unconcious when he received the blow. Although lying is very common in this country, I examined the right ear which was full of blood. Unfortunately it was a cloudy day, and I had to use artificial light; even then I could only see with difficulty. There appeared to be a small rent in the tympanum of which I was doubtful. Next day it was bright and I examined him in the sun, after washing the ear well; the condition was as shewn below:—

Condition on 13th February,



Congested area, spotted black.
Blood was oozing from the shaded area.

Now there are two causes of this injury, one direct and the other indirect. The injury to the tympanum was due to an indirect cause. Since he became unconcious from the blow there is probably a very fine fracture of the middle fossa of the skull, probably involving the Eustachian tube.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

My reasons for inferring a fracture of the middle fossa is that the bleeding was probably from the Eustachian tube, which would allow blood being discharged from all three points, ear, nose and throat.

In this case the rupture appeared to be in the postero-inferior quadrant of the drum and it is sufficient to consider the injury as *grievous* on this account alone.

A CASE OF VOLVULUS OF THE LARGE INTESTINE AT THE SPLENIC FLEXURE.

By T. S. DAKSHINAMURTHI, L.M.P.,

Sub-Assistant Surgeon, Alipuram Jail Hospital, Bellary Cantonment, Bellary.

A CONVICT Moplah, aged 66 years, was admitted to the jail hospital at 10 a.m., on 29th October, 1928, for colicky pain in the abdomen with a history of not having passed a motion within the previous 24 hours. The pulse was normal and 72 per minute. There was neither rigidity nor distension of the abdomen. He was given an ounce of castor oil at once which did not work his bowels. At 11 a.m. a turpentine enema was given with no result. By about 2 p.m. the abdomen was slightly distended. Discomfort increased and pain was localised to the upper abdomen. There was no marked rigidity. By 5 p.m. the abdomen was very much distended. There was definite rigidity and tenderness of the whole upper abdomen. The patient was feeling acute discomfort and was restless. Distension was more marked on the right side and the distended coil of the intestine could distinctly be felt. There was acute obstruction in the intestine with no passage of stools and flatus. His temperature was 98.8° and pulse full and 46 per minute.

The patient consented to the immediate operation proposed by the medical officer. He was anæsthetised and the abdomen was opened by a vertical incision 5 inches long in the upper abdomen about 1 inch to the right of the middle line. The transverse colon, which was much distended and congested, presented itself through the wound. The obstruction was, therefore, located below that portion. On search, a twist of the large intestine at the splenic flexure was discovered, the lower end of the loop lying over and across the upper one. The twist was released. The accumulated gas was expelled through the anus by careful pressure on the distended coil of the intestine and the abdomen was closed. The operation took only ten minutes and was done by the medical officer. The patient made an uneventful recovery.

The interesting points in the case are the following, viz:—

(1) The comparative rarity of a volvulus of the large intestine at the splenic flexure. It is stated in the textbooks that volvulus of the large intestine is common at the sigmoid flexure and the cæcum.

(2) For his age, the patient took choloroform very well.

(3) The necessity for surgical interference as early as possible in all cases of acute abdomen, in spite of age and other conditions of the patient, as surgery alone has a chance of giving him life.

My respectful thanks are due to my medical officer Dr. T. J. Gibson, I.M.D., who kindly permitted me to publish these notes.

TIGER BITES AND THEIR TREATMENT.

By K. G. KHANDEKOR, M.B., B.S.

Guna, Gwalior State.

RECENTLY I had to treat a dozen patients who had been mauled by tigers or leopards. It was not possible to treat all of them with serums, and iodine injections were only of limited use. So I had to fall back on some local application, and compresses of saturated solutions of magnesium sulphate were found of very great use. Pathologically, injuries caused by the teeth of the claws of these animals are of the nature of cellulitis. Wet compresses were applied over the inflamed parts and cavities containing pus were dressed with gauze soaked in the solution till the superficial inflammation had subsided (it usually took five or six days). Then no gauze was introduced into them, and the cavities healed promptly without any more discharge.

The temperature of the patients did not rise appreciably.

One patient was mauled by a tiger and his whole body was in a condition of surgical emphysema; he had no fracture of the ribs; the condition was probably due to gas-producing organisms. I was afraid to give him any intravenous injections as his veins could not be steadied and there was a danger of carrying some of the germs into the circulation along with the needle. The emphysema completely disappeared within four days by dressing the injuries with the solution of magnesium sulphate.

A FURTHER NOTE ON THE ACTION OF HÆMOPLASTIN.

By KAMAKHYA PROSAD LAHIRI, L.M.S.,

P. O. Bera, Dist. Pabna.

ABOUT four years ago, in April, 1925, a short contribution from the pen of the present writer appeared in this journal, under the caption "Hæmoplastin in Hæmorrhage." In this he reported favourably on the subcutaneous use of this hæmostatic in two cases of obstinate bleeding.

The patient who had uterine bleeding is still alive; she has had no further trouble from that cause. The patient who suffered from hæmorrhagic piles is also alive; he had a relapse of bleeding last year and another in the year previous to that. On both these occasions he was cured with hæmoplastin. Considering the unfavourable nature of the family history, he

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

now always keeps with him a few ampoules of hæmoplastin as a precautionary measure.

Last year the present writer had a case of epistaxis in an old man of 80 years. The loss of blood was very severe and it came on without any apparent cause. He adopted some of the usual measures recommended but without any appreciable benefit. The patient was not at first ready to bear the expense of treatment by hæmoplastin, so normal horse serum was given subcutaneously, but without any effect. As his condition grew worse, the patient agreed to the use of hæmoplastin. Administration of two subcutaneous injections of 2 c.c. each, at an interval of 24 hours, cured the patient.

A case of hæmorrhoids with profuse hæmorrhage was also treated successfully with this serum. The subject was a teacher, aged 40; three injections cured him.

A Bengali Hindu gentleman aged about 45 years was placed under the writer's treatment for severe hæmoptysis which he had had for three days. He was given calcium lactate and other drugs by the attending physician, but without any effect. On examination a few râles were audible with the inspiratory sounds at the right apex. The expiration was heard over the same area. The heart was healthy. Two injections of hæmoplastin in 2-c.c. doses stopped the bleeding.

Hæmoplastin being an animal protein, there is danger of its producing protein shock if the subject be hypersensitive to it. Dr. Pickering gives two examples of fatal shock in his book (*The Blood Plasma in Health and Disease*). Fortunately, the writer has not as yet met with a case of shock either mild or severe. Of course these examples will make him cautious in the use of the hæmoplastin in future, but will not deter him from its administration when life is threatened by hæmorrhage. The same risk is run in use of all antitoxic sera.

A HUGE OVARIAN CYST.

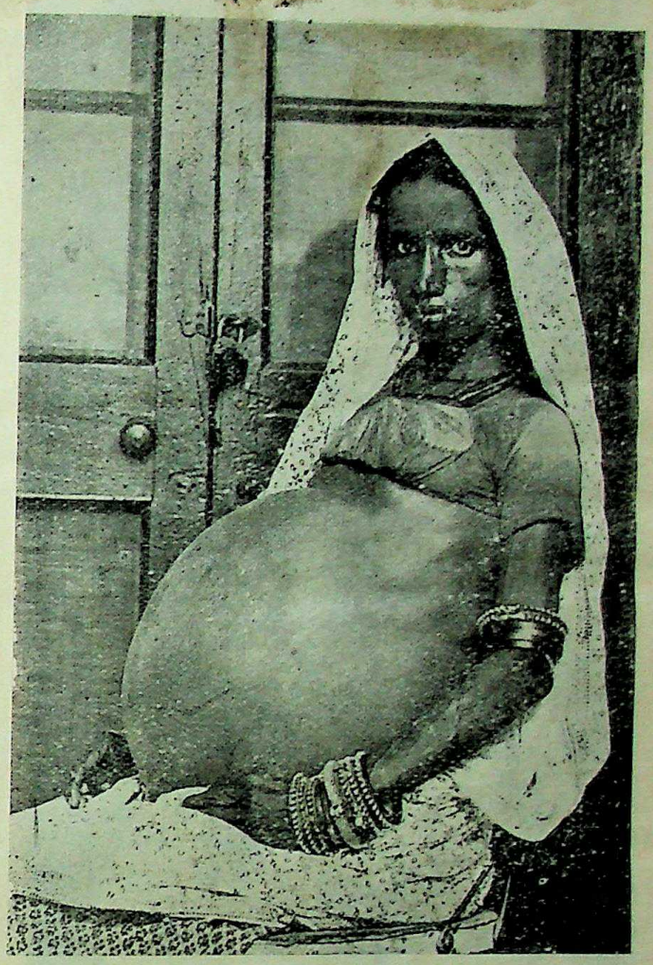
By ASST. SURGN. RAI SAHIB CHHAGAN NATH,
Officiating Residency Surgeon, Mewar, Udaipur.

CASES of ovarian cysts, though not very common in this part of the country, are met with now and again in hospital practice. The patient usually presents herself with a considerable abdominal enlargement, as admission to a hospital is only sought when all sorts of quack remedies, potion for ascites, and even waiting for pregnancy prove futile.

History.—The following is the history of the case. J., Hindu female, aged 40, married, nullipara, residence Entally, Mewar, was admitted to the Lansdowne Hospital, Udaipur, on the 14th September, 1928. She noticed gradual enlargement on the left side of her abdomen, which for the last two years had become very prominent. The abdomen had a spherical appearance, and a hard lump was felt on the left side, below the costal margin; the lump could easily have been mistaken for an enlarged spleen.

The circumference round her umbilicus was 44½ inches, and the measurement from the ensiform cartilage to the symphysis pubis 20½ inches. She had an emaciated look. Her urine was normal. On internal examination there was no abnormality of the uterus. Her menstrual periods were normal and regular.

Operation.—After thorough preparation, the patient was placed on the operation table, and an incision of about 4 inches was made in the median line below the umbilicus. After separation of the skin and recti, the peritoneal coat was divided. The anterior aspect of the cyst-wall was then survey ed with the hand.



On searching for adhesions the omentum was found at some places sticking to the sac and could not be removed. A small band was found on the left side, which was ligated and snipped. A Spencer-Wells' ovariotomy trocar was then plunged into the cyst-wall, and the fluid evacuated, but the evacuation was not as much as expected, as another big cyst was found inside it. This was also punctured and evacuated through the main cyst, care being taken that no fluid contents entered the abdominal cavity.

Description of the cysts.—The sac was then gradually pulled through the opening, the pedicle securely tied and cut. The pelvic cavity and the walls were sponged dry. The abdominal wound was sutured in the usual way.

On examining the sac, six more daughter cysts were found in it, containing fluid of different colour and consistency. The fluid in the main cyst was of a dark brown colour containing a degenerated cheesy mass, three contained clear ropy fluid, like saliva, two had sebaceous matter, one contained fluid like bile, and the one which was in the splenic region contained a tuft of hair and a rudimentary tooth.

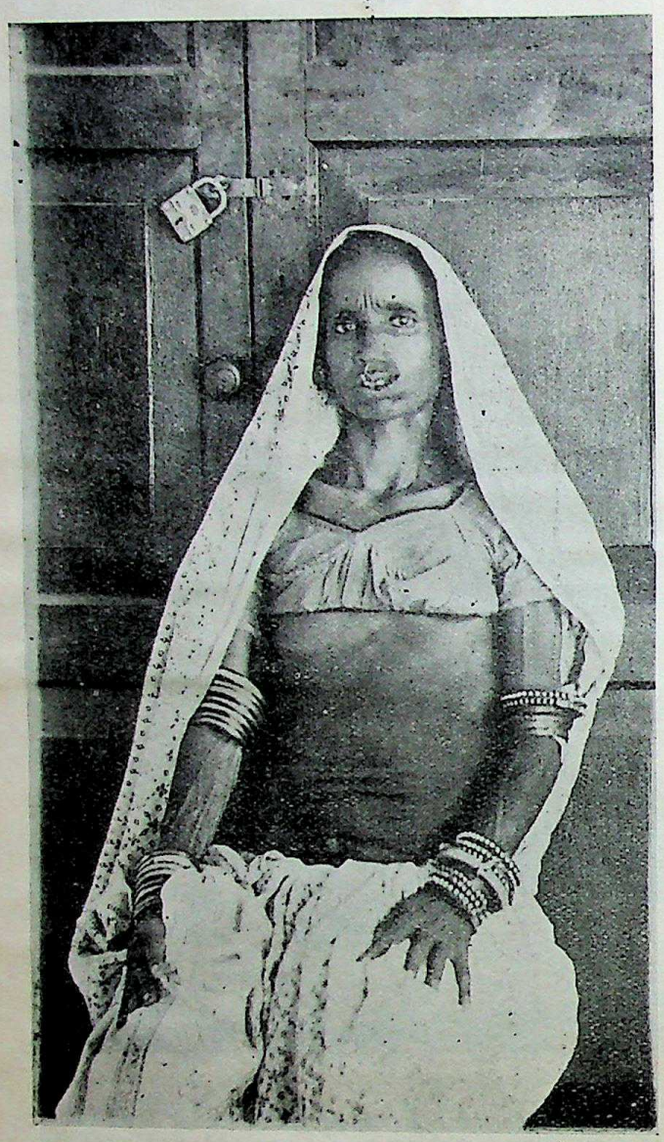
Weight of the fluid was 31 lbs., 4 ozs.
Weight of the sac was 3 lbs., 1 oz.
Weight of the hair and tooth 5 drs.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Making a total weight of the cyst equal to 34 lbs., 5 ozs. 5 drs.

The sutures were removed on the tenth day, the wound healed by first intention, and the patient made a rapid recovery. After operation she developed a voracious appetite, but this had to be controlled. Three weeks after the operation she was allowed to go home, as she



was very desirous to celebrate the *dhasera* festival at her own home as a 'new' woman.

My thanks are due to Dr. Sunder Lall, M.B., B.S., for his assistance.

SUMMARY.

The interesting features of this case are:—

(1) The huge enlargement of the abdomen, with a comparatively short history of two years.

(2) The solid feel of the lump on the left side resembling an enlarged spleen.

(3) The presence of a cyst inside a cyst; and the other half a dozen cysts each containing a different kind of fluid.

(4) Her great desire for food soon after the operation.

A FURTHER CASE OF DIAPHYSIAL ACLASIS, (MULTIPLE EXOSTOSIS) WITH A MARKED FAMILY HISTORY.

By H. STOTT, M.D., M.R.C.P., D.P.H.,
LIEUTENANT-COLONEL, I.M.S.,
Physician and Professor of Pathology,
and
P. A. SHUNANDAN LALL, M.B., B.S.,
Radiologist, King George Medical College, Lucknow.

IN the *Indian Medical Gazette* of January 1929, we reported seven cases of diaphysial aclasis (multiple exostosis) in Indians, including four cases from one family. The present case showed an even more marked family history, there being some 10 cases amongst 26 close relatives.

Hasan Mohamed Khan, aged 45, was admitted into King George's Medical College Hospital, Lucknow, in January 1929, for lung tuberculosis.

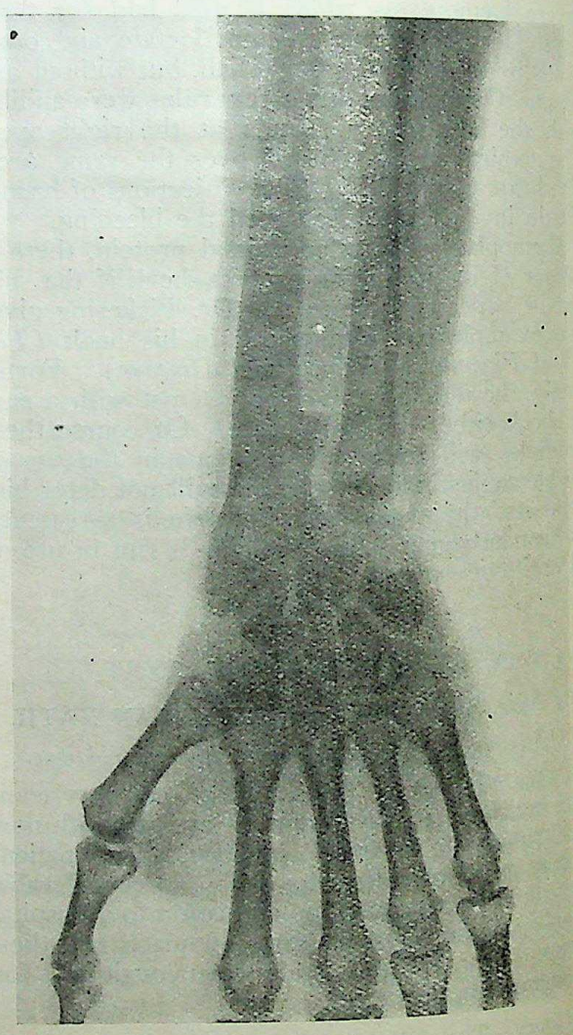


Fig. 1.

On physical examination, the following bony projections were noted:—

1. The lower end of the right femur was markedly enlarged with an obvious bony projection on the mesial side. (See *x*-ray Fig. 1.)

2. At the lower end of the left radius and left ulna. (See *x*-ray Fig. 2.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

3. A prominent bony lump, the size of a hen's egg from the cervical vertebra. (See x-ray Fig. 3.)

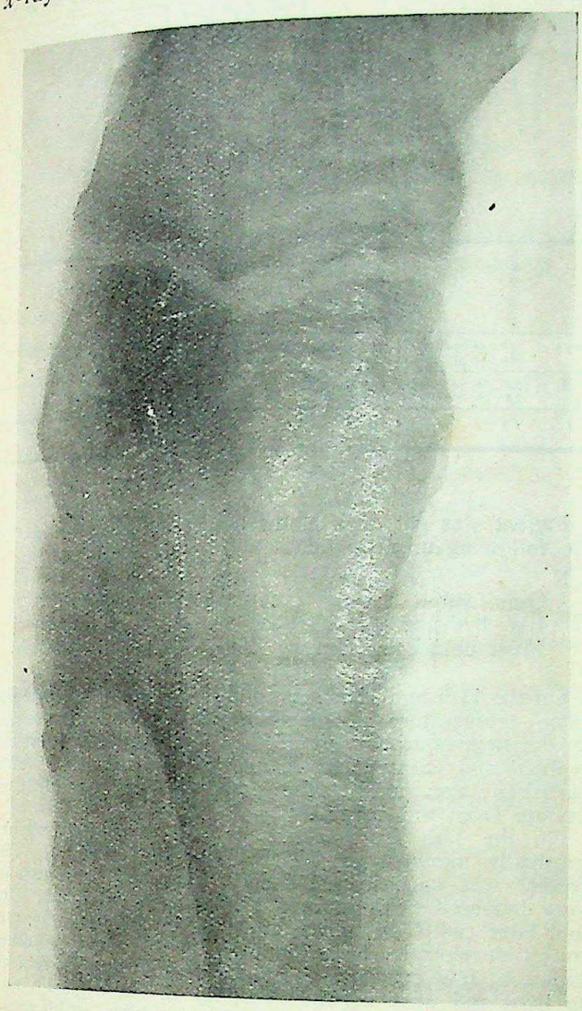
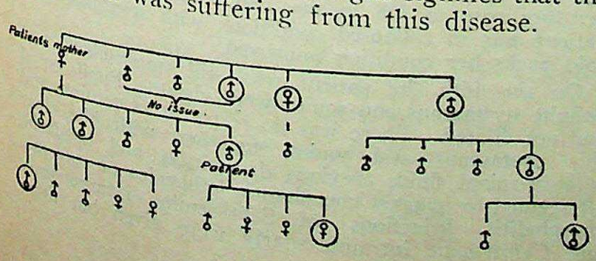


Fig. 2.

4. Some thickening of the acromial end of the left clavicle.

The patient states that the swellings have been present from his childhood without inconvenience, except that he attributes the cervical exostosis to injury produced some 13 years ago by the fall of a weight which he was carrying on his head and which struck his neck. He believes this lump has been growing larger of recent years. The whole of the left lung and also the right apex were the seat of extensive tuberculous disease and x-ray confirmed considerable infiltration in these areas. The family history is set out in the following chart where ♂ signifies male, ♀ female, whilst a circle round these signs signifies that the individual was suffering from this disease.



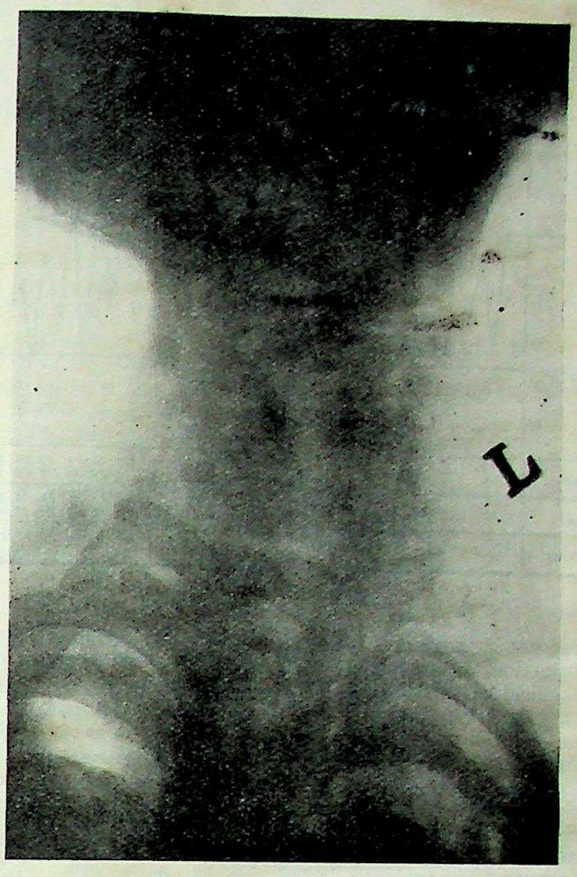


Fig. 3.

A CASE OF TYPHOID FEVER, RELAPSE, TOXÆMIC COLLAPSE AND RECOVERY.

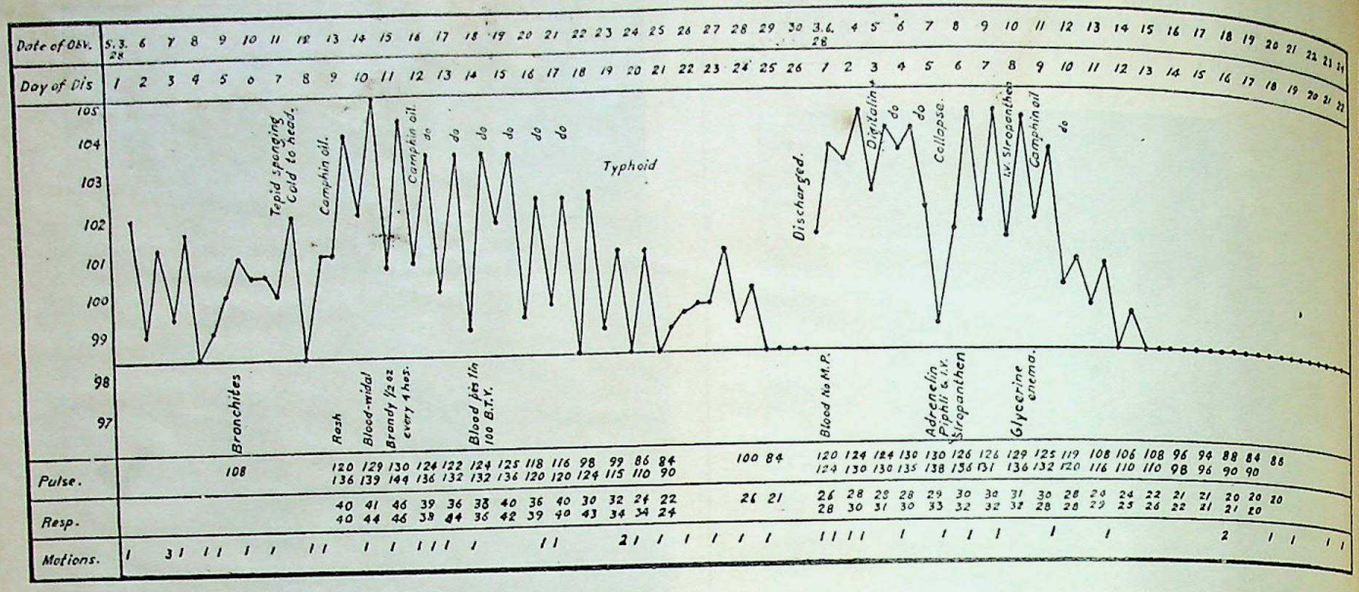
By CH. KRISHNAMURTHY, L.M.P.,

Sub-Assistant Surgeon, Central Jail, Rajahmundry.

K., ADMITTED for fever on 5th March, 1928. Blood examined—no malarial parasites found, leucopenia. He was given a few fractional doses of calomel as his tongue was coated and put on alkalies and quinine after Sinton's method. The temperature was normal on the morning of the 8th (see chart attached). Again from the same evening it began to rise, and from the 13th his pulse began to get weak. Tepid sponging every 3 hours and camphor in oil injections every 8 hours were added to the treatment, while glucose, 2 drachms every 4 hours, was also given. As the pulse was very quick, digitalis was added to one of the mixtures. There was bronchitis from the fifth day of the illness and a rosy red rash was seen on the chest and back on the 9th day. Blood was sent for the Widal reaction on the 10th day; it was reported positive to *B. typhosus* on the 14th day. Quinine was stopped and alkaline treatment alone continued while urotropine was given separately. All the time the patient was put on barley water and milk and plain water to drink freely. He became normal on the 24th day of his illness and continued so till a week later. On 3rd April, 1928 (30th day from the beginning) he started to have a temperature, 101.6°F. in the morning, rising higher in the evenings. The pulse was again feeble and rapid; and suddenly on 6th April, 1928 his temperature fell to 99°F., the pulse became thready, 158 per minute and, the body cold and covered with sweat. The abdomen was slightly distended and he complained of slight pain on the right side. The usual treatment for tiding over collapse was given, such as hot-water bottles, an injection of adrenalin and pituitrin, and brandy by the mouth. He was already having digitalin injections and camphor in oil daily. His pulse

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri



did not improve and I, therefore, gave him an intravenous injection of strophanthin 1|200 gr. By this time the medical officer was requested to see the case. His temperature then began to rise (now 100.6°F., 8 p.m.) and pulse of better tension and volume. It was 140 per minute. After discussing the possible causes of this collapse (perforation, hæmorrhage, toxæmia) it was decided to put the patient on turpentine enemata every 3 hours in mixture and watch. He began to improve and required another strophanthin injection on the 12th instant. The relapse lasted for 13 days. This is a clear case where the usual cardiac stimulants such as digitalis, strychnine, adrenalin, pituitrin, camphor in oil, brandy, ammonia and æther all failed, while strophanthin alone intravenously appeared to bring the patient round. It may be interesting to know that on the third day after the occurrence of collapse, the bowels were slowly opened by an enema and there was no trace of any hæmorrhage, while perforation was out of the question as there was no excruciating pain.

My thanks are due to Dr. C. R. Kamath, M.B. & C.M., Medical Officer, Central Jail, Rajahmundry for permission to publish these notes.

A CASE OF HYPERPYREXIA FOR DIAGNOSIS.

By C. R. PEREIRA, M.B., B.S.,

and

J. M. D'CRUZ, M.B., B.S.,

Bellasis Road, Byculla, Bombay.

SISTER S. was first seen on 10th May, 1928. She complained of a slight headache, occasional vomiting and continuous temperature ranging between 99° to 101°F. for two weeks previously. She had travelled from Madras to Bombay *en route* to Italy two days previous to her being seen. From her companion, who is a trained nurse, one could elicit the history that the patient was slightly drowsy during the journey. It appears she had been generally indisposed for about 6 weeks before coming to Bombay.

On examination, her pulse was 90, respiration 23 temperature 101°F., lungs and heart normal, tongue coated, bowels constipated, abdomen slightly tympanitic, urine clear. Beyond the headache and drowsiness (slight), there was nothing to suggest any nervous lesion. Pupils were equal and not dilated, there was no squint or nystagmus. Fundal examination was not done. The reflexes were normal.

Patient was put on a bland liquid diet and was given the following mixture t.d.s.

R

Quin. sulph.	..	.. grs. v.
Liq. hydrarg. perchl.	..	.. m. x.
Mist. chlorinæ (Burney Yeo)		.. ad. ℥i.

On the 11th and 12th her condition remained much the same—temperature remained more or less continuously in the neighbourhood of 101°. Agglutination tests for typhoid and paratyphoid A and B were negative. No parasites were found in the blood. Blood count did not deviate from the normal.

On the 13th from about 5 a.m. the temperature gradually mounted to 109°F. (in the armpit). The patient was unconscious, deeply cyanosed, respirations very laboured, with a fixed vacant gaze, upturned eyes and later twitching of the right upper and lower extremities developed. Pulse thready, heart sounds muffled, lungs, a few crepitations at the bases. Pupils reacted to light and were equal. Camphor in oil, digitalin and strychnine were given and with continuous cold packs the temperature came down to 104°.

At the suggestion of Lieut.-Col. R. H. who saw the case in consultation at this stage, grs. 9 quin. bihydrochlor. intravenously and grs. 9 intramuscularly were given.

On the 14th morning the temperature kept at 104°F., pulse 97, respiration 25. Twitchings had stopped. There was a definite retraction of the neck, Babinski's "upgoing toe," increased knee-jerks present, Kernig's sign absent. Pupils normal. Dr. B. saw the case of this stage. Lumbar puncture was done: the cerebro-spinal fluid did not come out under pressure, was absolutely clear, and a cytological examination proved the fluid to be normal. The urine showed a quantity of albumen, but no organisms. A blood film did not show parasites, and there was no leucocytosis or leucopenia. She was given quinine grs. x intramuscularly; glucose saline 3 pints were run under the breasts.

On the 15th the patient remained much the same. The heart was tending to fail. In addition to quinine, Plasmochin Co.: 2 tablets t.d.s. were given. The temperature rose to 108 in the armpit at 3 a.m. and the patient was in collapsed condition; with stimulants and cold packs her condition improved.

On the 16th the patient was still unconscious, and definite nystagmus and squint were visible. Pupils equal and not dilated. There was no response to quinine, and this nystagmus and squint, together with the clear cerebro-spinal fluid, previous drowsiness and headache all seemed to suggest encephalitis lethargica or epidemic encephalitis. Injections of Septicæmine intravenously and Cylotropine intramuscularly were given but there

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

was no response; the patient died on the 18th. Unfortunately autopsy was not possible.

The question is, was this a case of cerebral malaria which proved refractory to quinine and plasmoquine or a genuine case of acute encephalitis lethargica? Could it have been a case of typhoid (note the slow pulse and continuous fever in spite of the negative Widal reaction) together with a severe attack of malignant tertian? Was it a case of heat stroke though the climatic conditions under which she lived could hardly suggest this?

We are indebted to Dr. P. C. Bharucha, M.D. (Lond.), for his valuable help in reporting this interesting case.

ROUNDWORM INFECTION SIMULATING APPENDICITIS.

By B. SUKHAVANAM, L.M.P.,

Sub-Assistant Surgeon, Gadivenuly P. O.

S. S., male, age 35, Mohammedan, came to this dispensary for treatment of pain in the right iliac fossa on 7th December, 1928.

Ten days before he had had acute pain in the right iliac fossa. He went the headquarters station and sought treatment under a medical practitioner. He says he was given 3 injections (probably morphine) which relieved him and soon after he returned to his native village. Three days afterwards, he developed similar acute pain over the same region which was more acute than the previous one. Finding no relief after trying various indigenous drugs, he sought treatment in this dispensary, three days later.

The following was his condition on admission:—

(1) A fairly well-built man of 35 with an agitated facial expression due to the present condition.
(2) Pulse, 100.
(3) Temperature, 99.8°F.
(4) Tongue, coated.
(5) A distinct swelling at about McBurny's point which was also tender.
(6) Slight rigidity of the abdomen.

I ordered hot fomentations to the abdomen and an enema; to my surprise, the patient passed a roundworm after the enema was given and he even vomited one roundworm in my presence.

Hot fomentations were, however, repeated. In the night the following was given:—

Santonin	.. .. ..	gr. i.
Calomel	.. .. ..	gr. iii.
Soda bicarb.		gr. iv.

at bedtime, followed by castor oil on the following day. He passed several worms the next day and all the acute symptoms passed away. After observation for 3 days, he was discharged cured.

The main point of interest is that the symptoms and signs simulated appendicitis but were apparently due to roundworm infection.

A CASE OF SUPPRESSION OF URINE.

By B. SUKHAVANAM, L.M.P.,

Sub-Assistant Surgeon, Gadivenuly P. O.

I WAS called in to see a patient in a village 3 miles away on 25th January, 1929. The person who came to call me stated that the patient was suffering from retention of urine for the last 12 hours.

When I saw the patient at 8 a.m. on January 25th, the following was his condition:

The patient aged 28 years was in a condition of deep shock.

(1) Abdomen, distended.
(2) Pulse, weak and thready.
(3) Temperature, 97.8°F.
(4) Face, pale, sunken eyes.

On palpation of the abdomen no hardness or any localised swelling could be made out, especially over the region of the bladder, to account for the complaint—retention of urine. To clear my doubt, I introduced a catheter to draw out urine. Not a drop of urine could be drawn out. There was complete suppression of urine.

Meanwhile his general condition was threatening and so I gave pituitrin 1 c.c. hypodermically. An enema was also given which, however, did not act. The patient died at one o'clock the same day.

In this connection it may not be out of place to say that the native village of the patient was infected with cholera three months previously, and it has got an unprotected water supply from an open channel.

The sudden onset and rapid death within 19 hours after the attack suggests this to be case of cholera sicca, rather than intestinal obstruction in which a patient is known to live for 6 or 7 days after the onset of the symptoms. If it is a case of cholera sicca, the distension of the abdomen must be accounted for.

SPECIAL ARTICLE.

SOME REFLECTIONS ON OBSTETRICS AND GYNÆCOLOGY DURING 1928.

By V. B. GREEN-ARMYTAGE, M.D., F.R.C.P. (Lond.), LIEUT.-COL., I.M.S.,

Professor of Obstetrics, Calcutta Medical College, and Surgeon to the Eden Hospital.

OBSTETRICS.

Diabetes in Pregnancy.—Until recently the prognosis of a diabetic patient as regards conception and pregnancy has always been grave, the toxæmia tending to cause premature delivery, death of the fœtus, or coma. Puerperal sepsis in these patients is almost invariably fatal, but to-day, if a patient is treated with insulin and scientifically dieted, there is no ground for terminating pregnancy, and no reason why a living child should not be born. Puerperal complications are rare, and evidence has accumulated to show that pregnancy has no ill effects on the disease itself.

Mitral Stenosis in Pregnancy.—Séjourné, in a very able monograph on the subject of mitral stenosis in pregnancy, emphasises the fact that

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

radiological examination of the heart is necessary in order to determine the size of the left auricle before giving a prognosis. He lays down the dictum that if there be dilatation of the auricle, interruption of pregnancy is imperative even though there are no symptoms of cardiac distress or loss of reserve power. He warns against using ether in emptying the uterus and states that pregnancy should be forbidden in every case of mitral stenosis in which there has been a previous attack of œdema of the lungs. Our experience in the Eden Hospital bears him out, and I consider that in any case of mitral stenosis it is best to empty the uterus in the first two months of pregnancy, or at least warn the relations of the very grave dangers that are run by every patient who has this affliction.

Gall-bladder disease in Pregnancy.—Gall-stones are peculiarly common in females in the tropics, and particularly so among the wealthier classes who take little exercise and incline to eat rich food. The calculi are largely composed of cholesterol which is obtained from that excreted in the bile. During pregnancy there is always hypercholesterolæmia, and this predisposes to the formation of gall-stones, and may be the reason why the specialist and general practitioner so frequently is confronted with cases of gall-bladder disease during pregnancy. It should be our aim therefore to keep the blood cholesterol of all fat and well-to-do pregnant patients who have had symptoms suggestive of cholelithiasis at the lowest possible level.

The cholesterol of the blood is dependent in a large measure upon the diet, hence one method of accomplishing this purpose should be to reduce the ingestion of cholesterol bearing food. Such foods as fat, egg yolk, fried food, sweetbreads, liver, kidney, pork, oily fish, (*hilsa*), butter and cheese, should be omitted from the diet.

Placenta Accreta.—Nathansen draws attention to the fact that there is a condition of placenta accreta where the placenta is so attached to the myometrium that no spongy layer exists as an intervening space between the chorionic villi and the muscle of the uterus. This pathological anomaly occurs about once in twenty thousand cases, and if not recognised with the hand in the uterus, may be the cause of disastrous rupture of the organ when attempting to remove the placenta. He is of the opinion that placenta accreta can occur any time after the first month, and is most usually found—according to the literature on the subject—at the tubal angle and over the site of a submucous fibromyoma. The condition should be suspected if in any case of adherent placenta (1) there is no uterine bleeding, (2) there is no descent of the umbilical cord, and (3) there is no characteristic ball-like condition of the fundus. Should these three conditions be present, no attempt at Crédé delivery should be made. With every aseptic precaution, the uterus should be explored and if no line of clevage is found to exist between the placenta and uterus, hysterectomy is the only rational procedure, for by this means alone can rupture of the uterus be avoided, and the patient saved from death, which usually follows this catastrophe as the result of hæmorrhage or sepsis.

As a proof against the futility of attempting to separate the placenta, Polak and Frankl have demonstrated *post-mortem* in two cases, that in this pathological and anatomical type of placenta accreta it is absolutely impossible to separate the placenta from the uterine wall.

The writer welcomes this contribution to scientific obstetrics, for he has on two occasions lost patients from this condition, which he now realises would have been saved had he recognised the condition in time and performed hysterectomy. He feels sure that every experienced obstetrician in India will be glad to know of this condition and its correct diagnosis and treatment. The records of the Eden Hospital during the last seven years, demonstrate that out of 8,500 confinements, there were 71 cases of retained or adherent placenta; of these 20 died, a mortality of 28.2 per cent. Looking back at some of these cases now, I am sure that a few were cases of placenta accreta which could have been saved by hysterectomy.

Hydatidiform Mole.—There seems little doubt that this condition is more common in the tropics than is generally recognised, therefore it will serve a useful purpose to consider recent work on this disease, for Teacher has found that malignant transformation of hydatidiform mole occurred in 36 per cent. of cases, whereas Hitchmann, in a record of 240 cases, demonstrated that malignancy occurred afterwards in 48 per cent.

Seeing that the primary mortality of vesicular mole by itself is 20 to 25 per cent., and that the mortality of operation on cases which have developed chorionic epithelioma is at least 60 per cent., it seems rational to "jib" at the text-book methods of treatment which are laid down for hydatidiform mole, and to state that the expectant method of treatment is not founded on a scientific basis, for complacent tardiness has not served to mitigate the primary mortality of the disease, nor thwart the development of secondary malignancy with its widespread metastases.

Therefore the pendulum in many countries is swinging towards active surgical treatment. Many advocate that laparotomy, and then hysterotomy with complete visual evacuation of the uterus should be done, others consider that according to the age and parity of the patient, complete hysterectomy is the ideal method of treatment.

Immediate Repair of Birth Canal Injuries.—Potter, Davenport and Bubis in America have written enthusiastically of the treatment of all injuries to the cervix and levator ani by immediate suture. They state that the anatomical results are better and that the patient is saved time and expense if the suturing is done either at once, following the third stage of labour, or during the first five days. Bubis even goes further and deals with old rectoceles and cystoceles and states that

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the results justify the means, but such a procedure could only be carried out in a hospital, and therefore until such time as accouchements cease to occur in private houses, and are all done in hospitals properly equipped and staffed, it is unlikely that this American innovation will become popular.

Epidemic Encephalitis.—Roques, in the *Journal of Obstetrics and Gynæcology of the British Empire,* reports 21 cases and reviews the whole literature extant on this subject. The conclusions are—

1. Parkinsonism is liable to make its first appearance during or after pregnancy.
2. Parkinsonism frequently undergoes aggravation as a result of pregnancy, the aggravation taking place most commonly after early gestation or shortly after the confinement.
3. Parkinsonism does not cause sterility.
4. Pregnancy, labour and the puerperium are usually adversely influenced by Parkinsonism.
5. The children are almost always healthy at birth and apparently survive to live normal lives.
6. The termination of pregnancy is not to be advised for the following reasons:—

(*a*) that such termination does not benefit the course of the encephalitis;

(*b*) the mortality in the cases of artificially terminated pregnancies is the same as the average mortality of all cases.

(*c*) Cæsarean section is unnecessary for the sake of the child, except in a very small group of desperate cases in which the hope of saving the mother's life has been abandoned. Any operative interference in these cases is a very great risk.

7. Natural labour must be carefully watched for, for it may be completed without the knowledge of patient or attendants, with consequent risk to the infant.
8. The second stage should be completed as quickly as possible, using forceps if necessary. The mother should not nurse the baby.

Streptococcal Puerperal Septicæmia.—B. P. Watson reported an outbreak of virulent *S. hæmolyticus* infection in the Sloane Hospital, New York; 24 patients were infected and 9 died. Every known avenue of possible source of infection was investigated, and eventually it was considered that the streptococcus which was found in the nose and throat of certain doctors, nurses, and members of the domestic staff, was the origin of the outbreak.

He considers that these members of the staff were the indirect carriers, and as a result, every attendant in the maternity wards and labour rooms should be masked in future. He notes that every patient but one who had a positive blood culture died.

It is interesting to observe that the treatment carried out was that which we use in the Eden Hospital, namely, a modification of the Gordon Luker method together with blood transfusion. It will be noted that the mortality of this virulent streptococcal epidemic was 30.7 per cent., even though every scientific method of early diagnosis and treatment was at the disposal of the Director.

Failed Forceps Cases.—An interesting discussion arose at the B. M. A. meeting in 1928 on the above subject. Douglas Miller, Hendry, and Fletcher Shaw analysed 558 cases of unsuccessful forceps application. From the analysis of these cases it would appear that—

(*a*) One-third were due to disproportion between the head of the fœtus and the pelvis. In this group there were 29 maternal and 154 fœtal deaths.

(*b*) One-third were due to occipito-posterior positions. In this group there were 16 maternal and 100 fœtal deaths.

(*c*) One-third were due to anomalies of the soft parts and premature application of the forceps. In this group there were 9 maternal and 78 fœtal deaths.

These astounding statistics, comprising 54 maternal and 332 fœtal deaths, forcibly demonstrate the urgent necessity for propaganda and higher education of doctors and the public, as to the necessity of ante-natal care and the real art of obstetrics. For there can be no question that these tragic and appalling results in the hospital class of patient can, and should be, obviated, and this can only be done through the public press, and the General Medical Council insisting on a standard of teaching and practical instruction higher than now exists.

The authors indicate that the individual causes of maternal death were: sepsis 37; rupture of the uterus 8; post-partum hæmorrhage and shock 6; and pneumonia 3. Moreover, they point out that in 133 cases, that is 23.6 per cent., the puerperium was morbid, and that the patients only recovered after many weeks of exhausting fever.

Including still-births and neo-natal deaths, 357 of the infants were lost, a mortality of 64 per cent. These statistics indicate that ante-natal care is in its infancy among the poorer classes, but they also indicate that the standard of professional and midwife skill must be at a low level.

In India, ante-natal care is as yet in the embryonic stage, and if such are the statistical results in the cities of Edinburgh, Glasgow and Manchester, one dare not contemplate what may be the silent death roll of maternity in the tropics. But just as Great Britain is awaking to the necessity of fuller education and ante-natal care, so I trust the enlightened *intelligensia* of India will privately or publicly, with or without the assistance of Government, take stock of conditions and begin propaganda for the prevention of maternal mortality, by instituting ante-natal centres run by competent doctors and midwives in every municipality.

A part and parcel of every such scheme should be that post-graduate courses for doctors and midwives of every community should be held regularly for a month, four times a year in the big Presidency towns which contain maternity teaching units.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

GYNÆCOLOGY.

Treatment of Gonorrhœa.—Statham, reviewing the unsatisfactory and lengthy methods of treatment which have been used in the past, advocates the use of mercurochrome 1 per cent. solution. The patient is placed in the lithotomy position and the vagina is first washed out with a solution of boric acid, then a fenestrated Cusco speculum is introduced and the vagina and fornices are fully stretched. All muco-pus is cleared away and then a swab soaked in 1 per cent. mercurochrome is rubbed all over the cervix and vagina so that the solution reaches every part including the orifice to the cervical canal. Should there be urethritis, a small quantity of the solution is run into the bladder, retained there for a few minutes and then passed again. This technique is repeated every day for seven days, and at the end of that time, for another seven days, 1 : 1000 flavine is used. This method is rapidly and easily carried out, but it is absolutely necessary that all parts of the vagina be fully distended and swabbed over and that no pockets are left untreated. The treatment is not painful nor unpleasant, and as the offensive discharge rapidly clears up, the patient is encouraged.

I have used this method in pregnant and puerperal cases as well, and have been highly satisfied. After three or four weeks it will be found that bacteriological swabs from the cervix are negative.

Sterility.—In previous papers I have written on the importance of the Rubin insufflation test both as a diagnostic and therapeutic measure in cases of sterility, and I have given the indications for doing it. During the last year, however, many authorities have gone one stage further and have indicated that lipiodol injections through the cervix into the tubes, followed by *x*-ray photographs, is a surer method of examination and gives more certain indications for treatment.

10 c.c. of lipiodol are injected through a Record syringe attached to the ordinary Rubin cannula, a röentgenogram being taken immediately afterwards. This method is devoid of danger provided the usual precautions are taken. Some authorities consider that lipiodol has a beneficial effect on the tubal mucous membrane, for many cases have been recorded where pregnancy has occurred after demonstration of complete patency of the tubes by the *x*-ray photograph.

In a discussion at the B. M. A. on the subject of sterility, the general consensus of opinion was that organotherapy was useless except in the case of thyroid gland. It is my own opinion that thyroid gland has a spermo-genetic and ovo-genetic influence, and for many years now in cases of sterility, where the husband's semen was positive and the wife was to all tests normal, I have ordered only half a grain of thyroid extract *sicc.* twice a day to husband and wife for a period of six to twelve weeks. In some cases dilatation and insufflation has been done, in others, nothing at all beyond asking the parties to abstain from coitus for at least seven weeks. In a great number of cases the results have been most gratifying.

I do not believe that the preparations of ovarian extract of corpus luteum which reach the tropics from Europe are of the least value, either in the treatment of menstrual disorders or sterility, but I do believe that thyroid gland is useful; moreover, it is cheap, which cannot be said for other organic preparations.

Cancer of the Cervix.—Herbert Spencer, in the *British Med. Journ.*, 31st March, 1928, reviews the operative *versus* radiation treatment for this condition. He advocates vaginal hysterectomy in certain cases because of its lessened mortality and the superiority of the recovery over that of abdominal hysterectomy. He shows that the extended technique with para-vaginal incisions adopted by Schauta, Thaler, Peham and Stockel, has an absolute cure rate of 31 per cent. against the 28 per cent. for the extended abdominal operation of Wertheim.

He demonstrates that the removal of all glands which so complicates the issue of the abdominal operation is not absolutely necessary, for in two-thirds of the patients operated upon the glands on pathological section were proved non-cancerous.

He considers, however, that the radiation treatment of cancer of the cervix is the most important advance in all gynæcology, for its curative results are incontestable in early cases, 30 per cent. being absolute cures after seven years, with a minimum degree of risk, but the radiation should be in the hands of experts.

Benign Uterine Bleeding.—Meigs, in a very interesting paper, demonstrates the importance of studying the calcium metabolism in uterine bleeding. Until recently, it has been the habit of gynæcologists to prescribe thyroid gland in cases of amenorrhœa. Meigs, however, illustrates what has long been accepted as a fact by the French (Hertoghe), that hypothyroidism is very frequently the cause of menorrhagia and metorrhagia in young women, and that this type of woman is the one who most easily bruises at the least pinching up of the skin.

This hypothyroidism is associated with a greatly increased excretion of calcium, therefore, before unnecessary curettage, or other treatment such as injections of pituitrin or ergotine, or even the application of radium has been undertaken, he advises that the diet should be a full calcium one, and that if possible the patient should be by the sea or in a bracing climate, taking half a grain of thyroid twice a day for six to twelve weeks or more.

Contraception.—In previous papers I have summarized the advantages and disadvantages of the various methods used to-day as a means to birth control. None of these methods are absolutely sure in the tropics, and in many of them the disadvantages far outweigh any value set upon them by advertising agents.

Of recent years a plethora of booklets has appeared; many of these the writer has reviewed

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

in the columns of the *Indian Medical Gazette*. Briefly it can be stated that—

1. "Withdrawal" is the worst form for husband as well as wife, from a physical and psychological point of view.

2. "Douches," either before or after, are not successful in more than 50 per cent.

3. "Rubber pessaries" (Dutch cap or Stopes' check pessary) are difficult to adjust. They frequently fail in their purpose and when they are adjusted, tend to set up œdema and endocervicitis, with subsequent malaise, backache and menorrhagia.

4. "Quinine or other medicated pessaries" are frequently successful and easy to use, but they have the same undesirable tendency to set up endocervicitis and erosion of the cervix.

5. "Sponges," next to the condom, are the most efficient means at the disposal of the public, but just as the condom may rot and rupture, so the sponge may not be placed high enough or be sufficiently large.

The whole subject is an extremely difficult one for residents in the East, for there can be no question that from an economic and health point of view it is impossible to have children every year and for the mother to keep fit and bring them up properly.

There is a common fallacy abroad that there is a so-called "safe" period midway between two menstruations. Dickinson, in a very able paper, analysed this so-called "safe" period as a birth control measure, and his conclusions are almost identical with the writer's own findings during a period of ten consecutive years that he has been investigating this point. The conclusions are—

1. That there is no time in the month at which conception has not occurred in some women.

2. That if there is a "safe period," it would be better named a "low risk period," and that this period is the week immediately before the onset of menstruation. Dickinson states that only 1 in 10 women ever become pregnant during this premenstrual week.

3. Ovulation occurs between the 13th and 18th day from the beginning of the period, therefore we should except an *increased* tendency to conception at the middle of the menstrual month. It is probable that coitus liberates the ovum nearer the 13th than the 18th day. It is almost certain that conception never occurs after the 22nd day of the onset of menstruation.

4. The greatest height of fertility belongs to the 10 days following menstruation, coinciding with maximum sex desire.

Vaginal Sterilization.—It is not generally known that if for any reason sterilization is desirable or demanded, that it is by no means necessary to perform an abdominal operation, for it is perfectly easy for the expert gynæcologist to do the operation *per vaginam*. An inverted T-shaped incision is made above the cervix on the anterior vaginal wall, the bladder is quickly and easily pushed up and away from the anterior wall of the cervix, and then the utero-vesical pouch is opened transversely. The anterior wall of the uterus is grasped with peritoneal forceps or a cat's paw tenaculum, and the tube on each side is drawn down and ligated in a double loop with silk, and then let go.

The edges of the utero-vesical peritoneum are then sutured with a running stitch of catgut, and the edges of the vaginal incision brought together as usual with interrupted catgut.

The writer has done scores of these operations, the whole procedure being completed with or without primary curettage in less than 20 minutes. Vaginal douching is ordered *b.d.* and the patient gets up on the fifth day and goes home on the eighth.

The essentials for the operation are (1) that the patient should be a multipara in whom the pelvic supports are well relaxed, and (2) the uterus should be freely movable and easily drawn down.

The advantages of this operation are that if there be any prolapse or cystocele the interposition operation of Watkins can be performed *secundum artem* after the tubes have been ligated.

Acute Abdominal Pain in Women.—It is sometimes extremely difficult to come to a correct decision as to whether a woman has acute appendicitis, acute salpingitis, an ectopic gestation, or torsion of an ovarian cyst. In the initial stages there may be no tenderness or rigidity on palpation, but within a few hours the pains may be exquisite and the rigidity marked. These symptoms are dependent upon stimulation of the parietal peritoneum, and since the parietal peritoneum is supplied by the same cerebro-spinal nerves as the overlying muscles and skin, the accuracy with which an inflammatory stimulus from within the abdomen is localised can be easily understood.

Therefore to arrive at an anatomical diagnosis it is well to remember that we have three easily performed tests which are accurate in 75 per cent. of all cases.

1. Pick up the skin of the abdomen between finger and thumb, inch by inch from above downwards, and gently pull it away from the underlying muscle and fascia. The patient will inform you if there is pain at one place more than another.

2. Firm but gentle compression of the abdomen with the flat of the fingers, will tell you where the pain is greatest.

3. With a needle gently prick the abdomen in parallel lines from above downwards, where the greatest hyperalgesia occurs mark with pen or blue pencil.

In *appendicular* disease the pain, whether viscero-motor or sensory-motor, will be around or above a line drawn from the umbilicus to the anterior iliac spine.

In *salpingitis* the hyperalgesia will be just above and parallel with Poupart's ligament on *both* sides.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In *extra-uterine gestation* with distension of the tube, and possible extravasation of blood into the peritoneal cavity, the area of extreme sensitiveness is of the size of the palm of one's hand, from the anterior iliac spine to the middle line on one side. (It may also be most marked at one shoulder tip.)

In *torsion of an ovarian cyst* the hyperalgesia is on *one* side only, and rarely involves an area larger than two inches diameter just above the centre of Poupart's ligament.

These abdominal clinical features are of special importance in India to general practitioners, who oftentimes are not permitted the facilities of making a more accurate diagnosis by vaginal examination. If they will bear these tests in mind, occasion may arise when they can anticipate or prognosticate catastrophe if expert surgical skill is not sought.

Polypi of the Cervix.—It is necessary to sound a note of warning to all clinicians on the subject of polypi presenting themselves at the external os of the uterus, for although a large percentage are mucous polypus or submucous fibromata, quite a definite percentage of these cases are malignant, the degree of malignancy varying according to the type of cell element present. Therefore it is particularly necessary to stress the fact that *every* polypoid mass projecting from the neighbourhood of the cervix should be submitted for expert opinion after removal.

How important this is, will be seen when I mention that during the last 24 months I have removed 21 so-called polypi which were sent to me by general practitioners. On clinical examination they were apparently all benign, but on section of each, five were definitely neoplasms, and in consequence the prognosis and treatment was a very different matter.

One was a typical endometrioma growing from the margin of the external os, one was a perfect specimen of an adenomyoma projecting by a stalk attached to the neighbourhood of the internal os. One was a sessile mass the size of a raspberry which proved to be a chorionic epithelioma, one was an adenocarcinoma in an unmarried girl aged 26 which clinically was a typical submucous polypus with a long stalk attached just above the internal os. One was a case of sarcoma botryoides. In three of these the pathological finding was to me an extreme surprise, namely, the adenocarcinoma, the adenomyoma and the sarcoma case. In two of them, namely the sarcoma and the chorionic epithelioma, the patients refused further operation and were seen four and seven months later respectively, *in extremis* with secondary growths in the abdomen and lungs.

Three patients had complete hysterectomy done, two of them have been seen eight and ten months later and the pelvis is clear. The case of adenocarcinoma is still in hospital after operation a few days ago.

I have considered it important to bring this matter to the notice of practitioners, for oftentimes polypoid growths of the cervix are seen and complacently dealt with, and the growth not sent to the pathologist. Whereas they will see from the above cases how very serious and urgently important it is to obtain an expert opinion on every tumour growing from or in the neighbourhood of the uterine cervix.

Cox and Beneschek this year have recorded two cases of sarcoma botryoides, one in a child and one in an adult aged 29. In both, the clinical appearance was that of papilloma of the cervix, the tumours were removed locally for section and found sarcomatous. Hysterectomy was later performed, but in both cases the patients died of metastatic growths within a few months.

Maslen Jones also reports a case in a girl aged 18 which was dealt with locally and on section showed no evidence of malignancy, the diagnosis being mucous polypus. But five months later the patient returned with a large soft mass of semi-translucent polypoid bodies filling the vault of the vagina, which was inoperable. Six months later she died with pulmonary metastases. In his review of the case, he states that Paul Plett up to 1922 collected 36 published cases, and found that the age incidence of this virulent sarcoma was two and a half to fifty years.

He states that in the early stage of this neoplasm there appears to be no absolute evidence microscopically of the true nature of the growth, and that even when well formed the histological appearance of the polypus is so indefinite that where reliance is placed on this alone, radical operative treatment will be delayed too long.

While writing about morbid conditions of the cervix seen in recent years in Calcutta, I should like to call attention to the necessity of all general practitioners using a speculum and obtaining a good view of the cervix in women who complain of vaginal discharges, sanious or otherwise.

The reason I stress this point is that quite apart from the question of polypi or the early diagnosis of cancer, I have seen a considerable number of ulcers of the cervix which would have defied digital diagnosis solely.

For instance, I have records of four cases of early tuberculosis of the cervix, seen in consultation. I have seen soft based ulcers serpiginous in outline, which had no slough but exuded a thin ichorous discharge. In two of these, *Spirochæta pallida* were found, in one, typical Leishman-Donovan bodies were discovered, the condition being that of leishmania infection of the cervix, corroborated by finding the same bodies by spleen puncture. In several Ducrey's bacillus was isolated; in two patients who had early clinical leprosy there were ulcers creeping from the cervix on to the vaginal vault which gave a pure growth of *Streptococcus viridans*, although I expected to find the lepra bacillus. Possibly the bacillus would have been found, had a section of the cervix been permitted.

The lesson to be learned from these cases is that every ulceration of the cervix is a morbid process demanding expert diagnosis and treatment by knife, radium, cautery, or diathermy.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail).

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones. The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

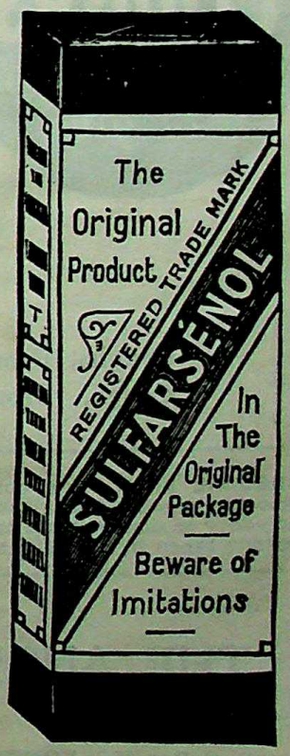
Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.



Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

OPOCRIN HEPAR.

Special liver extract for Pernicious Anæmia, Antitoxic effects, to favour intracellular absorption of Glucose, and for diabetes when due to defective functioning of the liver.

Price, bottle of 50 pills Rs. 3.

ONE GRAMME CREOSAL CONTAINS

Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

For COUGHS whatever their origin

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

For COUGHS whatever their origin

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY. P. O. Box 226, MADRAS.

Telegrams: "AMPSALVAS."

P. O. Box 7861, CALCUTTA. P. O. Box 134, RANGOON

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

MAY.

RECENT RESEARCHES ON THE FILTRABLE VIRUSES.

THE diseases due to filtrable viruses constitute a medical problem both of the greatest importance and of the greatest difficulty. Yet three recent events show that slowly but surely medical science is grappling with this problem. The first is the publication in 1928 by Messrs. Baillière, Tindall and Cox of a symposium on our present knowledge of the subject, edited by Dr. T. M. Rivers of the Rockefeller Institute for Medical Research, New York.* We reviewed this volume on p. 46 of our January issue, and have relied largely for information here on Dr. Rivers' opening chapter of that volume, in which the subject of the filtrable viruses in general is reviewed. The second event is the final and triumphant report of the *Field* Distemper Fund and Research Committee, which has placed in the hands of dog-owners a really successful method of prophylactic inoculation against this disease. The third is the recent work of Dr. E. Hindle of the Wellcome Bureau of Scientific Research on a protective vaccine against yellow fever.

The diseases due to filtrable viruses are a very large and miscellaneous group comprising diseases of men, animals, birds, insects, and plants; in fact the only feature which such diseases present in common with one another is that the virus concerned is filtrable. Even diseases of bacteria due to bacteriophages should be included in the list. With regard to man the chief diseases here concerned are the common coryzal cold, influenza, small-pox and vaccinia, chicken-pox, infectious encephalitis, herpes, rabies, trachoma—probably, —measles, yellow fever, dengue—almost certainly, and the diseases due to rickettsia bodies (typhus, trench fever, Rocky Mountain spotted fever, Japanese river fever), in which the causative rickettsia parasites have been discovered and the mode of transmission of the disease is known. With regard to animals, distemper of dogs is the most important disease; others are foot-and-mouth disease of cattle, encephalitis of rabbits, Rous' sarcoma of chickens, pleuropneumonia of cattle and sheep and goats,—where the disease is due to a minute bacillus of Pasteurella type, which is filtrable,—the pernicious anæmia of horses, and virus III infection of rabbits. In insects, sacbrood of honey bees, wilt of the European nun moth, and wilt of the gipsy-moth caterpillar are due to filtrable viruses. In fowls a most mysterious and acutely epidemic disease associated with a high mortality, which has spread from Great Britain within the last few years to India, and which appears to be common all over the world, is due to a filtrable virus.† The curious contagious epithelioma of fowls is also due to a filtrable virus. In plants the mosaic disease or infectious chlorosis, which often affects tobacco plants, is the best example. It is obvious that such a miscellaneous and heterogeneous collection of diseases is not a real classification on true ætiological lines; it is merely one due to the fact that all the viruses concerned are filtrable and of ultra-minute size. Future research will probably show the necessity for splitting up the group into different sections.

Modes of transmission of these diseases vary as widely as do the characters of the disease themselves. Some are extremely contagious (small-pox, coryza, and influenza); others (rabies) are conveyed by bites; others are insect borne (yellow fever, dengue, and yellows of aster plants); still others are only transmissible by grafting (infectious chlorosis of plants). Should the "patient" recover from the disease, an interesting feature is that he appears to have an immunity of a solid character (small-pox, vaccinia, measles, chicken-pox, e.g.), though this is not the case with influenza. The serum of recovered patients shows immune properties and is protective when inoculated into an exposed subject, yet such protective power is often of a weak order.

With regard to the real character of these viruses it is obvious that the viruses concerned must be of a living and particulate character, though usually invisible. d'Herelle considers that the bacteriophage has a diameter of less than 30 micro-microns. In brief these living organisms are almost approximate in size to the colloidal particles of fresh 1 per cent. hæmoglobin. With regard to cultivation of these viruses, the presence of living tissue cells in the culture medium appears to be essential, and the most successful results have been recorded with cultures in tissue plasma plus cells, following Carrel's method of cultivation of living tissues. On the other hand, a most curious feature of some of these viruses is their great resistance to desiccation; the virus in some instances may be infective after weeks of desiccation at room temperature (this suggesting the possibility of a spore or resistant-phase). Further, the viruses appear especially to attack young cells rather than mature ones; thus bacteriophage will cause lysis in young cultures of bacteria, but not in old ones.

Some of the viruses concerned exhibit a selective affinity for special tissues; thus vaccinia, small-pox, herpes, chicken-pox and contagious epithelioma of fowls attack the epithelial tissues, rabies and poliomyelitis the central nervous system, Rous' sarcoma the mesodermal tissues. The viruses are markedly cytotropic as a whole, and

* *Filtrable Viruses.* Edited by Dr. T. M. Rivers, M.D. Pp. 428 with several illustrations and 1 colour plate. 1928. London: Baillière, Tindall & Cox. Price, 34*s.* net.

† Vide *Calcutta School of Tropical Medicine Annual Report for* 1928, p. 32.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

appear to be incapable of survival outside the cell. Further, they cause the most curious changes in the infected cells. The cell nuclei, poisoned apparently by the toxins of the disease, extrude nuclear fragments into the cytoplasm, where a cytoplasmic reaction takes place. Sometimes (as in contagious epithelioma and warts) the virus appears to cause hypertrophy and stimulation of the cell, sometimes, however, lysis and destruction of the infected cell (as in variola, small-pox and bacteriophage). The lesions in cells affected by the virus are usually both characteristic and specific, and (as in the Negri body of rabies) this appearance can often be utilised in the diagnosis of the disease.

What these cell inclusions are, opinion is by no means unanimous. Some regard them as the actual parasites themselves, but there is very scanty evidence to support this view; bodies of such large size should not be filtrable. Others regard them as products of degeneration in the cell, poisoned by the toxins of the disease; still others as evidence of the presence of the ultra-minute organism responsible, plus a cytoplasmic reaction on the part of the host cell. In the case of rabies reliance for diagnosis is placed on the Negri bodies in the cells of the hippocampus major of the infected dog; in the case of scarlet fever, on the other hand, the whole trend of recent evidence goes to incriminate a hæmolytic streptococcus as the ætiological agent, and to discredit the view that the Mallory bodies (cell-inclusions) have anything to do with the ætiological agent of the disease.

The whole problem is rendered still more complicated by the suggestion by Gye and others that cancer is due to a filtrable virus plus some other secondary predisposing factor—possibly present in the plasma of infected persons.

Most of the viruses concerned can be preserved in glycerine or in cold storage, and glycerine appears to act in this instance as a desiccating agent, retarding autolysis of the tissues within which the virus is conserved. They are inactivated by high temperatures, but not as a rule by extremely low temperatures. Some workers have even gone so far as to suggest that, owing to their general resistance to desiccation, the filtrable viruses must be inanimate in nature, but there is but little evidence to support this view. It is much more probable that they are living bodies of extremely minute size, not visible under ordinary microscopic powers (except for the rickettsia bodies).

This necessarily brief summary shows at once both our knowledge of the filtrable viruses and the immense lacunæ which exist in our knowledge of the subject; and Dr. Rivers' book is of the greatest value to the laboratory worker from many points of view—not the least of which are the valuable bibliographies appended to the different chapters.

* * * *

Faced with such a problem, what can the medical profession do by way of prophylaxis against these diseases? The first lead was given long years ago when Jenner in 1796 introduced inoculation with cow-pox as a protective measure against small-pox. We wonder whether at that early era Jenner recognised the tremendous importance which future generations would attach to his discovery. The second step forward was the ever memorable discovery of antirabic immunization by Pasteur in 1885. Working entirely in the dark, with the most primitive of apparatus, Pasteur introduced the method of treating patients subject to infection at first with doses of dead rabies virus in the spinal cord of infected rabbits, followed by inoculations of the living virus of increasing intensity; it was one of the most notable experiments in medicine. This was followed by the introduction of the Hoëgyes' method of using dilutions of the fresh virus of gradually increasing strength; by the introduction of Semple and Harvey's dead carbolised virus (to-day in use in all the Pasteur institutes in India); and by the recent use of an ether vaccine, chiefly by Japanese and American workers.

Matters, however, have proceeded even further recently. Foot-and-mouth disease of cattle was studied in Great Britain by a special research committee appointed by the National Council for Medical Research, and they have now shown that protection can be afforded against that disease with a formalinized vaccine prepared from infected organs. The Distemper Research Committee (under the direction of Dr. Laidlaw and Mr. Dunkin of the National Institute for Medical Research, Hampstead) have shown that a solid immunity against distemper can be produced in dogs by inoculating them first with a vaccine made from dead virus, then with one made from an attenuated living virus. No less than 1,330 dogs under the care of 44 veterinary surgeons, and 325 couple of foxhounds have been inoculated and have proved resistant to infection under experimental or laboratory tests. It is hoped—writes the *Field* of 5th December, 1928—that this vaccine will shortly be produced on a large experimental scale by selected responsible biological chemists for sale.

Finally, come the recent series of papers of the last two and a half years dealing with the subject of yellow fever. Up to the middle of 1926 it was generally accepted that yellow fever was due to *Leptospira icteroides* Noguchi, 1919 (and a summary of the evidence in favour of this view is given by Knowles, 1928, p. 563). Several of the more careful American observers, however, have always doubted this evidence and have claimed that *L. icteroides* is identical with *L. icterohæmorrhagiæ*, the cause of infectious jaundice or Well's disease.

Theiler and Sellards (1926) appear to have been the first observers to conduct experiments directed to determine whether the two leptospira strains were or were not one and the same organism. They found that guinea-pigs immunised to either strain were completely protected against the other; and the possibilities raised by this

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

paper, as Dr. Wenyon notes in reviewing it, "are too radical for discussion." Sellards (March, 1927), next investigated Pfeiffer's phenomenon with reference to both *L. icteroides* and *L. icterohæmorrhagiæ;* he concluded that the evidence showed that the two were identical. Puttoni (May, 1927) concluded from cultural and serological observations that the two strains were one and the same. Sellards (July, 1927) in a review of the whole situation concludes that yellow fever and Weil's disease are two very different clinical types of disease; that *L. icteroides* is *not* the causative organism of yellow fever, and *"if the patient's serum gives a positive Pfeiffer reaction with L. icteroides he is suffering from Weil's disease and not yellow fever."* Brown and Davis (October, 1927) studied the adhesion phenomenon with reference to different leptospira strains; both *L. icteroides* and *L. icterohæmorrhagiæ* behaved alike. Sellards and Theiler (November, 1927) again investigated the Pfeiffer phenomenon and the protection tests with both *L. icteroides* and *L. icterohæmorrhagiæ;* they conclude that the former is synonymous with the latter. A *negative* reaction with *L. icteroides* is consistent with the diagnosis of yellow fever. Hosoya and Stefanopoulo (December, 1927) carried out agglutination tests, the Pfeiffer test on different strains, and immunization experiments; they conclude that *L. icteroides* and *L. icterohæmorrhagiæ* are identical. Schüffner, Mochtar, Proehoeman and Honig (1927) compared three strains of *L. icteroides* with strains of *L. icterohæmorrhagiæ* with regard to agglutination and lysis reactions; both behaved in the same manner; further, *L. icteroides* would not survive in the mosquito *Aëdes ægypti* longer than the fourth day after the feed.

About this time the Rockefeller Foundation Commission on yellow fever in West Africa was formed and sent out—with the most tragical results, for Professor Adrian Stokes, Professor Noguchi and Dr. W. A. Young each in turn fell victims to and died from the disease which they were investigating. Stokes, Bauer and Hudson (January, 1928) appear to have been the first workers to establish the fact that the monkey *Macacus rhesus* is extremely susceptible to inoculation with yellow fever virus. This they further confirmed in March, 1928, and showed that *Macacus sinicus* is also susceptible, but to a less degree. Mathis, Sellards and Laigret (February, 1928) confirmed this, and found that the disease could be experimentally transmitted from monkey to monkey by infected mosquitoes. Meantime Baermann and Zuelzer (February, 1928) had carried out extensive researches with different types of leptospira, the result of which was to throw considerable doubt upon the diagnosis of species by serological tests; *L. icteroides* they found to behave in all respects as did *L. icterohæmorrhagiæ.* Schüffner (March, 1928), reviewing the whole series of papers and researches, concludes that *L. icteroides* is identical with *L. icterohæmorrhagiæ;* further, *L. icteroides* is absent from the West African cases of yellow fever, although these are typical of the disease. Bruynoghe and Cornil (March, 1928) conclude "the results establish the biological identity of *L. icteroides* and *L. icterohæmorrhagiæ,* and in view of the clinical differences between Weil's disease and yellow fever, we are compelled to believe that the specific agent of this latter infection is still unknown"—a position which Sellards had taken up some time previously.

Further confirmation of this opinion is to be found in two other papers recently published. Neave Kingsbury (1927) has shown that *L. icterohæmorrhagiæ* will not survive in the stomach of *Aëdes ægypti,* and if—as must now be taken to be proved—*L. icteroides* is identical with *L. icterohæmorrhagiæ,* then the former cannot be the causative agent of yellow fever. Still further. Kligler and Ashner (August, 1928) have shown that the mid-gut of mosquitoes of genus *Aëdes* actually possesses the property of immobilising and destroying spirochætes of leptospira type. The present day consensus of opinion is that *L. icteroides* is identical with *L. icterohæmorrhagiæ;* that the few cases from which Noguchi succeeded in isolating leptospira were cases of Weil's disease occurring during an epidemic of yellow fever; that the causative agent of yellow fever is still undiscovered, and is of the nature of a filtrable virus.

Further results remain to be reported, however. Sellards and Hindle (April, 1928) found that frozen liver tissue and blood from a yellow fever case, imported from Dakar in North Africa to London, were still infective to *Macacus rhesus* monkeys, and that the virus would withstand freezing for at least twelve days. This enabled the disease to be established in *M. rhesus* monkeys in London for experimental purposes. Hindle (June, 1928) showed that a strongly protective vaccine could be prepared by grinding up the liver of infected monkeys in a formalinized or carbolised saline solution; a phenol glycerin vaccine gave solid immunity against the disease. This work follows closely upon the lines followed by the workers on fowl plague, dog distemper, and foot-and-mouth disease, and it would appear that the best vaccines against infections due to these filtrable viruses are to be obtained by formalinized or carbolised emulsions of organs of experimental animals infected with the disease. A consignment of some 200 *M. rhesus* monkeys was recently shipped from the Calcutta School of Tropical Medicine to Dr. Hindle in London, and it is to be hoped that a really efficient, protective vaccine against yellow fever in man is at last within sight.

* * * *

We have attempted to summarise as briefly as possible the trend of recent work upon the very important problem of diseases due to the filtrable viruses. At first sight this might seem to be unimportant to medical workers in India, but we believe its importance to India to be very great. Rabies, small-pox, the unsolved problem

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of dengue (which presents such close analogies to yellow fever), influenza and coryza—these are all Indian problems of the first magnitude; and the research worker in India would do well not to neglect a study of what is being done in other countries towards solving the mysteries associated with the filtrable viruses. Lastly, it is not unlikely that such a study will help towards the elucidation of the cancer problem. Does the true ætiology of cancer involve three main factors: a filtrable virus, a hereditary tendency, and a local stimulus in the form of irritation?

(We cannot conclude these notes without acknowledging our indebtedness to the *Tropical Diseases Bulletin*, from which we have culled the fullest information).

R. K.

REFERENCES.

Baermann, G. & Zuelzer, M. (Feb., 1928). Die Einheitlichkeit aller tierund menschenpathogenen Spirochäten vom Typus der *Spirochæta icterogenes* syn. *icterohæmorrhagiæ* und der mit ihr verwandten. Wasserspirochäte vom gleichen Typus II Mitteilung. *Cent. f. Bakt.*, I. Abt. Orig., CV, p. 345. (*Trop. Dis. Bull.*, XXV, p. 602.)

Brown, H. C. & Davis, L. J. (Oct., 1927). The adhesion phenomenon as an aid to the differentiation of leptospira. *Brit. Journ. Exp. Path.*, VIII, p. 397. (*Trop. Dis. Bull.*, XXV, p. 106.)

Bruynoghe, R. & Cornil, J. (March, 1928). La parenté du *Leptospira icteroides* et du *Leptospira icterohæmorrhagiæ*. *C. R. Soc. Biol.*, XCVIII, p. 598. (*Trop. Dis. Bull.*, XXV, p. 544.)

Hindle, E. (June, 1928). A yellow fever vaccine. *British Med. Journ.*, I, p. 976. (*Trop. Dis. Bull.*, XXV, p. 539.)

Hosoya, S. & Stefanopoulo, G. J. (Dec., 1927). Sur la différenciation du *Leptospira icteroides*, du *Spirochæta icterohæmorrhagiæ* et de certains autres spirochétidés voisins. *C. R. Soc. Biol.*, XCVII, p. 1447. (*Trop. Dis. Bull.*, XXV, p. 608.)

Kingsbury, Neave A (1927). *Proceedings of the 7th Congress Far Eastern Association of Tropical Medicine.*

Kligler, I. J. & Ashner, M. (Aug., 1928). The leptospiricidal power of extracts of *Aëdes ægypti* (*Stegomyia fasciata*). *Trans. Roy. Soc. Trop. Med. and Hyg.*, XXII, p. 181.

Knowles, R. (1928). *An Introduction to Medical Protozoology.* Calcutta.

Mathias, C, Sellards, A. W. & Laigret, J. (Feb., 1928). Sensibilité du *Macacus rhesus* au virus de la fievre jaune. *C. R. Acad. Sci.*, CLXXXVI, p. 604. (*Trop. Dis. Bull.*, XXV, p. 538.)

Puttoni, V. (May, 1927). Rapports entre *Leptospira icteroides* (Noguchi) et *Leptospira icterohæmorrhagiæ* (Inada et Ido). *C. R. Soc. Biol.*, XCVI, p. 1139. (*Trop. Dis. Bull.*, XXV, p. 105.)

Rivers, T. M. (1928). *Filtrable Viruses.* London, 1928.

Sellards, A. W. (March, 1927). The Pfeiffer reaction with leptospira in yellow fever. *American Journ. Trop. Med.*, VII, p. 71. (*Trop. Dis. Bull.*, XXIV, p. 720.)

Sellards, A. W. (July, 1927). The relation between Weil's disease and yellow fever. *Ann. Trop. Med. and Parasit.*, XXI, p. 245. (*Trop. Dis. Bull.*, XXV, p. 105)

Sellards, A. W. & Hindle, E. (April, 1928). The preservation of yellow fever virus. *British Med. Journ.*, I, p. 713. (*Trop. Dis. Bull.*, XXV, p. 539.)

Sellards, A. W. & Theiler, M. (Nov., 1927). Pfeiffer reaction and protection tests in leptospiral jaundice (Weil's disease) with *Leptospira icterohæmorrhagiæ* and *Leptospira icteroides*. *Journ. Trop. Med.*, VII, p. 369. (*Trop. Dis. Bull.*, XXV, p. 543.)

Schüffner, W. A. P. (March, 1928). De tegenwoordige stand van het leptospirovraagstuk. *Nederl. Tijdschr. v. Geneesk.*, 72nd year. 1st half, No. 13, p. 1552. (*Trop. Dis. Bull.*, XXV, p. 605.)

Schüffner, W., Mochtar, A., Prochoeman, S. & Honig, L. (1927). Weitere Beitrage zur Ætiologie des Gelbfiebers und der Bedeutung der *Leptospira icteroides* Noguchi. *Abhandl. a.d. Auslandskunde*, Hamburg Univ., XXVI, p. 500. (*Fetschrift Nocht.*). (*Trop. Dis. Bull.*, XXV, p. 544.)

Stokes, A., Bauer, J. H. & Hudson, N. P. (Jan., 1928). The transmission of yellow fever to *Macacus rhesus*: preliminary note. *Journ. American Med. Assoc.*, XC, p. 253. (*Trop. Dis. Bull.*, XXV, p. 537.)

Stokes, A., Bauer, J. H. & Hudson, N. P. (March, 1928). Experimental transmission of yellow fever to laboratory animals. *American Journ. Trop. Med.*, VIII, p. 103. (*Trop. Dis. Bull.*, XXV, p. 538.)

Theiler, M. & Sellards, A. W. (1926). The relationship of *Leptospira icterohæmorrhagiæ* and *Leptospira icteroides* as determined by the Pfeiffer phenomenon in guinea-pigs. *American Journ. Trop. Med.*, VI, p. 383. (*Trop. Dis. Bull.*, XXIV, p. 709.)

ADDENDUM.

Abstracts of recent work upon the filtrable viruses.

DISTEMPER.

(The *Times*, 29th Nov., 1928.)

THE Distemper Research Committee are able to give a highly satisfactory account this morning of the results of their labours during the last five years. The scientific investigations which it describes have been carried out by Dr. P. P. Laidlaw and Mr. G. W. Dunkin, both of them in the service of the Medical Research Council; while the cost of the undertaking has been met partly by the *Field* Distemper Fund and partly by money voted by Parliament for medical research and administered by the Council, who have made substantial contributions in the shape of land, buildings, and labour. Thanks to the initiative of the *Field* newspaper and the efforts of all who have shared in the enterprise—to whom every dog-owner and dog-lover in the land must be deeply grateful—a secure addition has been made to the previous sum of knowledge on the causation of the disease, and new methods adopted for its prevention as the outcome of this advance have already met with practical success. But the prospective benefits of the inquiry do not end there. As the official chiefs of the *Field* and Medical Research Councils, the Duke of Portland and Lord Balfour, state in the preface to the report, the knowledge and experience gained will certainly have a wider value in the study and control of virus diseases in general, not only in other animals, but in men. The technical considerations involved in this last aspect of the inquiry—by far the most important of its results—need not as yet be examined in detail. It is enough to record the fact that the effort to find some means of preventing the disease which is the greatest curse of dog-life seems to have opened up a line of research which may prove in time to be of lasting benefit to human beings.

It is, however, in its special application to dogs that the immediate interest of the present report is to be found. The reason for its publication at this particular moment is that a point has been reached when it has been found possible to render them resistant to infection by distemper. That fact has now been proved beyond dispute once and for all. After examining the conflicting theories on the possible origin of the disease, the investigators accepted Carré's conclusion that the agent causing it is a virus or ultra-microscopic organism, and finally succeeded in making the animals immune against infection by a double inoculation, first with a vaccine which is the sterilised virus of distemper, and then with an attenuated strain of living virus. By this process 1,330 dogs, under the care of forty-four veterinary surgeons, have been successfully immunised against distemper, and 325 couples of foxhounds from fifteen different packs have been treated in the same way with the same satisfactory results. In the Puckeridge, to quote one report, twelve couples were inoculated in February of this year. In April distemper broke out.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

but none of the treated hounds developed the disease, whereas of the uninoculated thirty-five couples contracted it and eleven couples died. The fact that results so encouraging have been attained after only five years of patient investigation, undertaken in the face of many and great difficulties, is a wonderful tribute to the scientific skill of the research workers and a most promising omen for further progress on the same lines.

The method of preventing distemper in any given dog consists of a double inoculation. Distemper occurs in dogs, not as was once supposed by a visible germ or micro-organism, but by an invisible one which is recognisable only by the virus or poison which is the sign of the organism's presence. The virus is the concomitant of the organism causing distemper in dogs and is present in all cases of distemper. The first inoculation of the dog which is selected for treatment is made with a vaccine which is in fact the virus of distemper made inactive by laboratory treatment. The second inoculation is made after an interval of about ten days with a weak or attenuated strain of the living virus. This dose of living virus is a hundredfold times as much as that which would suffice to infect any dog with distemper which had not been previously vaccinated with the first vaccine, or had not suffered from distemper already. But with a dog so vaccinated, the dose of living poison produces only slight symptoms, sometimes none at all, because it was rendered partially immune by the first vaccination. The second vaccination makes it completely and permanently immune.

The preparations of the vaccine and of the virus requisite for the inoculations are not yet available for distribution among the general public, or even among the veterinary practitioners, who are the proper people to employ them. But arrangements will be made for their production by responsible biological chemists on a scale such as will make them generally available.

FOOT-AND-MOUTH DISEASE.

(*British Med. Journ.*, 11th Aug., 1928, p. 268.)

THE third progress report of the Foot-and-Mouth Disease Research Committee is a bulky volume of 141 closely printed pages, relieved only by photographs of the new experimental station for work with cattle at Pirbright, and by a series of photomicrographs illustrating the histology of the foot-and-mouth lesion at various stages of its development. It opens with a most illuminating summary, compiled by the committee for the benefit of the Minister of Agriculture, of the new knowledge elicited by experts working at various centres under the direction of individual members of the committee.

Regret, tempered however with satisfaction, is expressed by the committee that so many members of the research staff have had to relinquish their work for the committee on their appointment to important permanent positions in the pathological world. It is pointed out that the training of competent workers takes time, and that lack of permanency of these research appointments will always seriously handicap continuity of research until the scientific veterinary service of this country acquires some very considerable accession to its permanent staff of workers. Some delay has occurred in connection with the contemplated experiments on bovines at the experimental station, Pirbright owing to the difficulty of securing absolutely efficient isolation of experimental units. It is hoped, however, that the new arrangements with regard to loose boxes and incinerators, the construction of which has involved much thought, will give the assurance of effective isolation, which is imperative if experimental results are to be confidently assessed.

The committee notes that many problems connected with the infectivity of cattle at various stages of the disease still await solution, but with the reconstruction of the experimental station progress in this important direction will, it is hoped, be rapid.

The new experimental data now available to the reader cover an extraordinarily wide range of subjects, and the hundred pages or so of small print which embody the carefully compiled protocols and research summaries by the various members of the working staff may well appal all but the specialist in virus disease. For the others the admirable summary of the present state of knowledge compiled by the committee will afford not only ample food for reflection, but will convey the assurance that the knowledge already gained by sound, patient, and well-directed research has illuminated many dark corners, not only within the narrow bounds of foot-and-mouth research, but also within the vast sphere of virus disease in general. No student of the subject, therefore, can fail to be impressed by the mass of important data which have accumulated since the highly susceptible and inexpensive guinea-pig became available for foot-and-mouth investigation.

It is possible to sketch the new data only in the briefest form. Appendix I, written by F. C. Minett, D.SC., M.R.C.V.S., contains details of the work carried out at the Ministry's Laboratory, New Haw. These reports deal with various problems of disinfection of virus-containing materials such as filtered vesicle fluid, various substrates of wood and iron with virus dried on their surfaces, hay, hides, and manure artificially impregnated with virus, the idea being to simulate natural conditions as closely as possible. Why phenol is relatively so inactive is not yet explained. Formalin and mercuric chloride also possess low efficiency in these three-hour exposure tests probably owing to their slower action. In the presence of added organic matter (saliva and fæces added to small pieces of virus-containing epithelium), and with a time limit of twenty-four hours, it was found that the disinfecting value of chlorine, iodine, and potassium permanganate was reduced one-thousand times, while the concentration of phenol, cresol, and formalin required for disinfection was not appreciably different in the two series of tests. Application of these results to the disinfection of artificially contaminated hay and hides showed that spraying of model haystacks with a 1 in 1,000 solution of formalin allowed to evaporate was very effective. The result is important in view of the experimentally ascertained fact that virus allowed to dry on hay has a long life. The soaking of artificially contaminated hides with 1 per cent. formalin for forty-eight hours was certainly efficient, but was prejudicial to the leather, and some other method must be sought.

Further work on the important question of immunization by means of formolized virus has been carried out, and it would appear that for the immunization of guinea-pigs no vaccine has proved superior to the formolized virus (contact with 0.1 per cent. formalin at 26° C. for forty-eight hours at pH 7.6). A single injection of this vaccine is followed by an immunity which can be recognized so soon as forty-eight hours, and it is effective up to two months. By "effective" is understood the inability of the living virus to produce secondary lesions in the body (tongue and feet) after introduction into the immunized animal by the usual intradermal route in the pad of a hind foot. Primary vesicle formation at the site of injection still takes place, and in this respect the artificially protected guinea-pig differs from the naturally recovered animal, in which neither local nor general symptoms appear in response to a fresh dose. There is a further difference in that the blood of vaccinated animals does not contain demonstrable viricidal antibodies, whereas no difficulty is encountered in demonstrating their presence in naturally recovered animals. Experiments in which large quantities of virus were given intravenously to normal, vaccinated, and naturally recovered animals, showed that in the two latter series no virus could be demonstrated in the blood after half an hour, whereas in the normal animal it could be recovered up to two or three days. It would seem, therefore, that in the case of animals vaccinated with modified virus, immunity to subsequent experimental infection is due to some profound alteration in the excitability of cell tracts (most probably of the reticulo-endothelial system) which are capable of responding at once to new infective antigen owing to their previous training or education by the formolized virus. The position is really on all fours with that of experimental pneumococcus or typhoid infection,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and, indeed, the more these viruses are studied the more do they seem to come into line with the visible bacteria in matters of pathogenesis. The formolized virus is believed to be dead by all criteria applied; yet it may not be so.

RECENT WORK ON THE FILTRABLE VIRUSES.

(Editorial, *British Med. Journ.*, 25th Aug., 1928, p. 346.)

IN spite of the difficulties that beset the experimental investigation of diseases belonging to the virus category, and particularly of those which affect man, knowledge appears to be slowly but steadily advancing in regard to this group of pathogenic agents. How widespread and varied are the activities of these viruses is well brought out in the recently published book by Dr. Thomas M. Rivers and his colleagues of the Rockefeller Institute at New York. In this book the present state of knowledge is set out concerning selected examples of viruses affecting respectively man, other mammals, birds, insects, and plants. Nor is the end necessarily there, for some authorities maintain that the bacteriophage associated with the names of Twort and d'Herelle is nothing else than an instance of an ultra-microscopic virus affecting bacteria themselves.

The chief interest to the medical reader, however, of recent work on viruses lies in the light it tends to throw on diseases of man brought about by agencies of this group. Here at present data are perforce limited, and, as the pitfalls are many, caution is particularly necessary. Nevertheless, some encouraging facts are emerging with regard both to prophylaxis and diagnosis. The important question whether it is possible to prevent a disease of the virus category by means of killed virus was apparently solved some years ago when rabies virus killed by phenol was successfully introduced into India for the prevention of hydrophobia; the credit for this advance is due to the pioneer work of Sir David Semple and his colleagues. Parallel but less convincing results in a preventive sense have from time to time been reported experimentally on animals with vaccinia virus inactivated by heat, and more recently by Knoepfelmacher and Stöhr in the human subject; it would seem that dosage is here an all-important factor and that repeated injections may be necessary for success. Moreover, according to its most recent report the members of the Foot-and-Mouth Disease Research Committee appear to have satisfied themselves that protection can be obtained against that disease with the virus after it has been killed by means of formalin.

A further direction in which progress is being made is in the application of serological methods to the diagnosis of virus infections. Experimental evidence has been furnished by a number of observers to the effect that specific antibodies occur regularly in the serum in cases of infection by the viruses of vaccinia and variola. We may note in particular that, according to Mervyn Gordon, in the serum of rabbits suitably prepared against vaccinia, specific antibodies showing an equal affinity for the viruses of vaccinia and of variola can be demonstrated by the complement-fixation test, and also by the agglutination or precipitin test. Evidence was found that serum prepared by such means against vaccinia virus could be used for the diagnosis of small-pox. It is of special interest in this connection to observe from the latest report of the Foot-and-Mouth Disease Research Committee that Professor Ciuca of Bucarest, working in London at the Lister Institute, has succeeded in applying the complement-fixation test to the diagnosis of infections by that virus, and that in this way he has been able to distinguish between the two different types of foot-and-mouth virus.

Recent developments, therefore, in the study of the filtrable viruses are of considerable promise, and their general tendency is to bring these infections more and more into line with those produced by the ordinary pathogenic bacteria.

YELLOW FEVER PROPHYLAXIS.

(Editorial, *British Med. Journ.*, 24th Nov., 1928, p. 947.)

INTEREST in yellow fever and its prophylaxis has been awakened by recent reports and correspondence in the *Times* referring to protective vaccine and its use in South America. The history of yellow fever investigations is both interesting and tragic, for others besides Adrian Stokes, Noguchi, and Young have lost their lives while probing into its secrets. The first definite advance in our knowledge of the etiology was made in 1901 by the American Commission, consisting of Reed, Carrol, and Agramonte, who, working at Quemandos, proved that the vector was the mosquito *Stegomyia fasciata*, or, as it is now known, *Aëdes argenteus*. It is true that many years before then both Beauperthuy and Finlay had suspected this mosquito, but the results of the American Commission placed the matter on a sure foundation. Two years later, at Rio de Janeiro, the observations were confirmed by the French Commission, composed of Marchoux, Salimbeni, and Simond. This newly acquired knowledge placed at the disposal of hygienists a method of prevention of which they availed themselves to the full in Central and South America, largely under the auspices of the Rockefeller Foundation. The yellow fever mosquito, which breeds in collections of water in and around houses, was relatively easy to attack. By stringent regulations and untiring inspection it was found possible to keep the mosquito index below the critical level, so that yellow fever as a terrible menace has ceased to exist in the great foci in the New World. There is, however, always the danger that it will appear where the anti-mosquito measures have not been applied, or should the energy of attack be abated. The disease is also endemic in West Africa, and from time to time occurs in serious epidemic form. Though some believed that the African disease was not yellow fever, there is no longer any doubt as to its nature.

It would appear that the application of the anti-mosquito measures which have proved so successful in America presents greater difficulties in West Africa, owing probably to the more primitive native population. This being so, it was all the more desirable that some other method of combating the disease should be discovered. Great hopes in this direction were raised by the announcement by Noguchi in 1919 that he had isolated the causative organism—*Leptospira icteroides*—which was allied to that which produces infectious jaundice or Weil's disease. With it a vaccine was prepared and an antiserum in horses, and these were issued for prevention and treatment. Though some observers appeared to confirm Noguchi's findings, there gradually accumulated evidence that Noguchi's leptospira was identical with that of Weil's disease. At this juncture, in 1925, the West African Yellow Fever Commission of the Rockefeller Foundation went to West Africa, where medical officers in the Colonial Service had repeatedly failed to recover a leptospira from cases of yellow fever. The late Adrian Stokes, who joined the Commission as a British representative, together with Bauer and Hudson, made the most important discovery that the disease was inoculable to Asiatic monkeys, particularly *Macacus rhesus*. In it the virus was easily maintained by direct inoculation of blood and tissues, or by mosquito transmission. This at once opened up a field for experimental investigation. It was shown that the disease was caused by a filtrable virus and not by a leptospira. Noguchi then, as an independent worker, went to West Africa from the Rockefeller Institute, and commenced his work at Accra at the laboratory of which W. A. Young, who had long experience of the disease in West Africa, was the director. As is well known, Noguchi and then Young fell victims to the infection. Though Noguchi's results have not yet been published, it is understood they are in agreement with those of the West African Yellow Fever Commission, which was working at Lagos.

Finally, A. W. Sellards of Harvard University went to Dakar, and with Mathis again confirmed the susceptibility of the Asiatic monkey. Sellards, as recorded in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the *British Medical Journal*,[1] on his return came to London and brought with him frozen virus, which, proving infective, enabled work to be carried on in this country. With this strain of virus Edward Hindle, the Beit Fellow in Tropical Medicine, carried out investigations in London at the Wellcome Bureau of Scientific Research. Applying to the experimental disease in monkeys the methods which had proved successful for the production of vaccines in the hands of Laidlaw and Dunkin in the case of dog distemper, and of Todd in the case of fowl plague, Hindle[2] found, that a phenol glycerin emulsion of the liver would confer on monkeys an absolute immunity against enormous doses of virulent virus. Meanwhile Aragao (1928), working at the Oswaldo Cruz Institute in Rio de Janeiro, demonstrated the susceptibility of the Asiatic monkey to the South American disease, and by a cross immunity test proved the identity of the American and West African viruses. Receiving Hindle's paper on the preparation of vaccine, Aragao repeated the observations with the American strain, and, after administering the vaccine to a number of laboratory workers with no untoward results, issued it for use in a small epidemic. In all, between three and four hundred people were vaccinated without accident, and, though no unwarranted conclusions are drawn, it is noted that none of the vaccinated contracted the disease. These encouraging results are being followed by the production of the vaccine on a larger scale, so that it will be available for use by the Public Health Department of Brazil.

One other aspect of the question deserves mention—namely, the protective action of immune serum of convalescents. It was shown by the French Commission in 1903 in the case of human beings, and by Stokes, Bauer, and Hudson in monkeys, that a comparatively small dose of serum from a recovered case of the disease would protect against infection. There is here a method of diagnosis in doubtful cases which may be of the greatest service. Furthermore, convalescent serum will confer an immediate immunity, and will have its uses when it is desired to immunize more rapidly than by vaccine. Hindle's vaccine, however, if it proves to be as effective in human beings as it is in monkeys, will be of the utmost value in the prevention of yellow fever, which hitherto has depended on a precarious and ceaseless vigil over the ubiquitous insect vector.

[1] Sellards and Hindle: *British Medical Journal*, 28th April, 1928, p. 713.
[2] Hindle: *British Medical Journal*, 9th June, 1928, p. 976.

ADDENDUM.

In the March, 1929 issue of the Gazette, the following paragraph was omitted in error from Dr. N. C. Dey's notes on "A Case of Post-Kala-azar Dermal Leishmaniasis":

"My gratitude and thanks are due to Captain H. Lyngdoh, the then Civil Surgeon of Nowgong, for his encouragement and corroboration of my findings."

CORRIGENDUM.

On page 199 of the April, 1929 issue *for* "By A. Mallannah, M.D., D.P.H." *read* "By S. Mallannah, M.D., D.P.H."

Medical News.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

(DIVISION OF TROPICAL MEDICINE AND HYGIENE.)

Examination Result. 85th Term. October, 1928—February, 1929.

Passed with Distinction.

S Batchelor—Winner of "Duncan" medal.
T. C. Backhouse.
J. Bryant.
L. S. Chatterji.
R. S. F. Hennessey.
M. Hewitson.
W. S. Nealor.
A. J. W. Wilkins.

Passed.

C. M. Africa.
K. P. Anklesaria.
E. A. Aslett.
F. C. K. Austin.
D. C. Bell.
P. S. Bell.
D. D. Bhargava.
J. S. Brown.
J. A. Carman.
I. E. Chandler.
A. D. Charters.
N. Chilton.
H. L. Chopra.
J. C. Chukerbuti.
A. H. Craig.
M. Das.
T. J. Davidson.
G. E. Dodds.
A. N. Duggal.
A. L. Goddard.
J. G. Green.
H. E. Hargreaves.
E. Haworth.
W. Hunter.
H. Joomye.
N. Kamchorn.
C. Libert.
L. S. Liu.
S. I. McMillen.
A. Mearns.
G. M. M. Menzies.
G. W. Milledge.
C. E. G. Nunns.
N. M. Rand.
S. L. Rikhye.
J. S. Robinson.
S. F. Russell.
I. A. Senanayeke.
E. H. Stahly.
R. Stanford.
E. M. Turner.
F. B. Turner.
O. R. Unger.
A. E. S. Wharton.
E. W. Whitcomb.
C. D. Williams.
D. B. Wilson.

12*th February*, 1929.

D. T. M. (BENGAL) PASS LIST 1929.

At the examination held in April 1929 at the Calcutta School of Tropical Medicine for the Diploma in Tropical Medicine of the Faculty of Tropical Medicine, Bengal, the following 34 out of 40 candidates were successful:—

Passed with distinction.

1. Raymond George Penington, M.B., B.S. (Melbourne University), Methodist Missionary Society of Australia, appointed to Australia Mandated Territory, New Guinea.

Passed.

(Arranged in alphabetical order.)

2. Alexander Clement Abraham, L.M. & S. (Hyderabad University), Assistant Medical Officer, Osmania General Hospital, H. E. H. The Nizam's Department, Hyderabad Division.
3. Piyara Lal Bahl, M.B., B.S. (Punjab), Civil Assistant Surgeon, Burma Government.
4. Ramesh Chandra Basubarman, M.B. (Cal.), Health Officer, Behala Municipality, Behala, Calcutta.
5. Jogendranath Bhattacharyya, M.B. (Cal.), Bacteriologist, Bactro-Clinical Laboratory, Ltd., Calcutta.
6. Gopinath Chandra, M.B. (Cal.), Private Practitioner, Bengal.
7. Lieut.-Col. John Beresford Christian, M.R.C.S., L.R.C.P. (Lond.), I.M.S. (Retd.).
8. Jaganath Das, M.B. (Cal.), Civil Assistant Surgeon, Bihar and Orissa Government.
9. Monnoolall Dave, L.M.P. (C. P.), Assistant Medical Officer, C. P. Government.
10. Rashehari Ghose, M.B. (Cal.), Private Practitioner, Bengal.
11. Narendra Nath Ghosh, M.B. (Cal.), Civil Assistant Surgeon, Bengal Government.
12. Adam Hamilton Harvie, M.B., ch.B. (New Zealand University), Medical Missionary, Jagadhri Mission Hospital, Punjab.
13. Kodavayur Venkateswaran Raju Iyer, L.S.M.F. (Mad.), L.T.M. (Cal.), Assistant Surgeon, M. S. M. Railway.
14. Lancelot Richard Jones, L.M.F. (Bengal), Assistant Surgeon, Indian Military Department.
15. Anantha Vasudeva Kamath, M.B., B.S. (Mad.), Municipal Health Officer, Calicut, Madras.
16. Ragaretna Kanagasabapathy, M.B., B.S. (Mad.), District Health Officer, North Arcot, Madras.
17. Debendra Chandra Majumdar, M.M.F. (Bengal), Private Practitioner, Bengal.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

18. Satis Charan Mallik, M.B. (Cal.), Private Practitioner, Bengal.
19. Rakhal Krishna Mandal, M.B. (Cal.), Private Practitioner, Bengal.
20. Arthur Clifford Martin, Diplomate, Madras Medical College, Assistant Surgeon, Indian Military Department.
21. Francis Gregory Martin, Diplomate, Madras Medical College, Licentiate in Medical and Surgical Society of Apothecaries, London. Assistant Surgeon, Indian Military Department.
22. Gerald Edward McDonald, Diplomate, Madras Medical College, Assistant Surgeon, Indian Military Department.
23. Joseph Patrick Monisse, Diplomate, Madras Medical College, Assistant Surgeon, Indian Military Department.
24. Sachindra Nath Mukherjee, M.B. (Cal.), Assistant Analyst, Calcutta Corporation Laboratory, Calcutta.
25. Hari Ballabh Dass Nanhorya, M.P., B.S. (Bombay University), Assistant Surgeon, C. P. Government.
26. Narayanan Govindan Pandalai, M.B., B.S. (Mad.), Civil Assistant Surgeon, Madras Government.
27. Kallenkarai Narayana Pisharoty, M.B., B.S. (Mad.), Civil Assistant Surgeon, Madras Government.
28. Bantval Gopalkrishna Prabhu, L.M.S. (Mad.), District Health Officer, Coimbatore, Madras.
29. Beltangady Bhujanga Rao, M.B., B.S. (Bom.), B.HY. (Bom.), Officer in charge, Chemico-Bacteriological Laboratory, Karachi, Sind.
30. Jitendra Mohan Sen Gupta, M.B. (Cal.), Civil Assistant Surgeon, Assam Government.
31. Mahesh Dutta Tewari, M.B. (Cal.), Civil Assistant Surgeon, Bihar and Orissa Government.
32. Tulsi Ram, L.M.P. (Lahore), Sub-Assistant Surgeon, Provincial Laboratory, Delhi Province, Delhi.
33. Tarini Prasad Varma, M.B. (Cal.), Civil Assistant Surgeon, Bihar and Orissa Government.
34. Robert Dalrymple Wilson, Diplomate, Madras Medical College, Assistant Surgeon, Indian Military Department.

THE ANTISEPTIC.

The Antiseptic, our contemporary in Southern India, is celebrating its 25th anniversary. The journal was founded by the joint efforts of Dr. T. M. Nair and the Hon'ble U. Rama Rau, the former being the first editor; the first number appeared in May, 1904. In 1919 Dr. Nair died and the editorial work was taken up by Dr. Rama Rau; the latter's son, Dr. U. Krishna Rau, joined him as associate editor in 1924. During the last quarter of a century the journal has done much to improve the position of the medical profession and to further the cause of medical science in this country.

We congratulate our contemporary on its past achievement and wish it every success for the future.

Current Topics.

Dengue Fever

(*Lancet*, December 29th, 1928, p. 1348.)

IN 1927 the town of Durban and its vicinity swarmed with *Aëdes ægypti* (*Stegomyia fasciata*). The sanitary sloth thus plainly signalled was justly rewarded during the latter half of 1927 with some 50,000 cases of dengue fever. In the autumn of that year a small epidemic of dengue fever occurred in Athens; and in the summer and autumn of 1928 an epidemic of dengue of unexampled severity, which from Athens swept over nearly the whole of Greece. The main features of this epidemic were described in the September number of the *Lancet* and Dr. Phocion Copanaris's report to the Office International d'Hygiène Publique has now appeared. Favourable climatic conditions permitted prolongation of life and development of *Aëdes ægypti* all through the winter in certain quarters of the city of Athens, in warm houses, and in cess pits which by their construction held a considerably higher temperature than that of the air outside. In these warm shelters aëdes escaping the lethal action of cold formed the connecting chain between the autumn epidemic of 1927 and the culminating enormous epidemic of the summer of 1928. It has been shown that aëdes once infected remains infective for so long as she lives. During winter and spring these aëdes infected a certain number of persons who in turn infected fresh generations of aëdes. It is noteworthy that the epidemic of 1928 started in the same crowded, ill-ventilated, and insanitary quarter of Athens in which began the epidemic in the autumn of 1927. Again, as in 1927, the cases occurring in the winter and spring and even up to early in July 1928 were diagnosed as typhoid or paratyphoid fever. In retrospect they are seen to have been typical cases of dengue fever.

The epidemic reached its peak in the second half of August, and from then progressively diminished, but not before nearly every inhabitant of Athens and Piræus had been stricken. The comparatively few who had been infected in the previous autumn escaped with few exceptions. From mid-August the infection was carried by incubating cases to the provinces outside Athens. It raged in the centre and south of Greece; the north was less affected, and in the northern mountains the only cases were refugees from Athens. Altitude by itself, however, is of uncertain protection, for in Syria dengue has occurred at 5,000 ft. above sea-level. Clinically the illness presented its typical features—sudden onset, slight rigor, headache, increasingly severe bone and muscle pains, and fever rising to 40°C. In most cases during the first two days there was an intense erythema of face and thorax, becoming scarlatiniform on the third and fourth days. At this point the temperature fell, to rise again to a maximum of sixth and seventh, or rarely eighth day, and then dropping sharply with profuse sweatings. In some the exanthem was terminal. Gastro-intestinal disturbances were frequent. In not a few there was slight albuminuria and slight pulmonary congestion. During recovery there was bradycardia. At first the epidemic was benign in character; later it became clinically severe, so that deaths occurred not only in the aged and previously diseased, but a few also in the young and previously healthy. Among these severe cases there occurred hæmoptysis, hæmatemesis, intestinal and uterine hæmorrhages, severe albuminuria and hæmaturia, cerebral hæmorrhage, convulsions, syncope, nervous and psychic troubles. The great majority of fatal cases, however, were among the aged. Relapse appeared only among those who left bed and returned too soon to everyday work, the relapse being in every feature more severe than the primary attack. Autopsies were few. They revealed no inflammatory lesions, but rather a cellular degeneration in liver, kidney, and heart. The stomach and intestines showed submucous petechiæ or larger hæmorrhages. The suprarenals were apparently unaffected. There were certainly many more than 800,000 cases: 1,240 deaths were recorded. Treatment was symptomatic. The blood of infected persons showed a leucopenia with relative lymphocytosis; no spirochæte was found. Investigations undertaken by the Pasteur Institute in Athens confirmed the findings of Ashburn and Craig. Filtered and unfiltered blood conveyed the disease by direct transmission to healthy persons. The disease was also experimentally transmitted by *Aëdes ægypti* 12 days after their feed on infected persons, and the aëdes remained infected during their life.

Atmospheric temperature during the summer of 1928 in Athens and generally all over Greece was high. In 1927 and throughout the summer of 1928 an astounding increase in the numbers of *Aëdes ægypti* was noted. The

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

untidy sloppiness of most Greek houses and yards provided innumerable and ideal breeding-places for aëdes. It was noted at Salonika in September 1928 that aëdes abounded in the small hutments where lived "refugees"—dengue fever smote all these families—and was entirely absent from the households of better dwellings not far off where aëdes was very scanty. Prevention obviously lies primarily in the destruction of aëdes. The community that suffers from dengue fever has deserved the visitation.

Renal Therapeutics.

(*British Med. Journ.*, December 22nd, 1928, p. 90.)

Treatment of Infections of the Urinary Tract.—K. Kelsted and E. Schiödt (*Acta Med. Scand.*, September 28th, 1928, p. 268) insist that for an accurate estimate of the value of any therapeutic method in treating infections of the urinary tract the nature and locality of the infection must be known. Urine obtained by ureteral catheterization under strict asepsis must be examined chemically, microscopically, and bacteriologically, since otherwise the exact site of the disease cannot be determined. The most common infecting micro-organism is *B. coli*, then come *B. proteus*, *Staphylococcus aureus* and *albus*. Treatment includes the use of autogenous or stock vaccines; irrigation with various antiseptic solutions, such as silver nitrate (1 to 2 per cent.), boric acid, or mercurochrome; and flushing the urinary system from kidney tubules to urethra with large quantities of fluid combined with various antiseptics. The authors recommend keeping the urine acid and administering hexamethylenetetramine or salol. Calcium chloride and ammonium chloride increase the acidity of the urine. In some cases alternating acidification and alkalinization of the urine are advantageous. The authors treated 70 patients in all, comprising 28 cases of pyelitis and 42 of cystitis; pyuria was associated with bacilluria in all. Most of the cases were complicated by such conditions as senile debility, carcinoma of the bladder, and prostatic hypertrophy, with heart disease. In all of the 70 cases the authors combined the administration of calcium chloride and ammonium chloride with urinary antiseptics, such as hexamethylenetetramine, salol, or hexyl-resorcinol. Only six cases of pyelitis and six cases of cystitis became free from bacteria under internal treatment. The remaining 36 cases of cystitis, after prolonged internal treatment, required further local treatment—1 per cent. silver nitrate solution for three consecutive days. Disinfectants are said to be useless for preventing phosphatic encrustation of catheters and Pezzer tubes. The authors believe that antiseptic treatment is comparatively useless when large quantities of fluid are administered; reduction of the urine to half its volume increases greatly its bactericidal power. They conclude that it seems advisable to combine treatment with restriction of the fluid intake.

Intravenous Quinine.

(*Lancet*, December 29th, 1928, p. 1351.)

A REPORT on limitations to the use of intravenous quinine in the treatment of malaria has been presented to the Council on Pharmacy and Chemistry, New York, by Dr. Kenneth F. Maxcy, of the United States Public Health Service. In the course of an able summary he recalls that J. Morgenroth in 1918 estimated that the quinine content of the blood was 1 in 20,000 a few minutes after intravenous injection, and 1 in 150,000 after oral administration of therapeutic doses. Disappearance of the drug from the blood is very rapid; R. A. Hatcher and H. Gold could not detect its presence in individual specimens 30 minutes after oral or intramuscular administration. It is not merely excreted, for only 25 per cent. can thus be accounted for, the rest being broken up into simpler substances, a process for which the liver seems to be largely responsible. W. Kirschbaum has produced malarial infection by injecting blood which had been set aside for 24 hours after being mixed with quinine to the extent of 1 in 10,000, a concentration far greater than has ever been maintained in circulating blood. Again, in certain cases which they investigated, W. Ramsden, I. J. Lipkin, and E. Whitley found the quinine content of the blood to be highest, and cinchonism greatest, in those in whom parasites persisted longest. Clearly, then, quinine in itself is not plasmodicidal. But of the effect of quinine in curing malaria there is no question at all, and we must suppose that it exercises its striking action in some indirect way. We have to recognise that intravenous injection does not act by suddenly making available a large amount of parasiticidal substance. And, if the liver is the organ where quinine is not only most rapidly snatched from the circulation but most effectively turned into the plasmodicidal substance—whatever that may be—then intravenous medication does not seem to lead to the desired result as directly as administration via the mouth and portal vein. Accurate observations of the efficiency of intravenous quinine medication are due to British observers headed by J. W. W. Stephens in Liverpool and H. W. Acton in India. The latter have shown that with it the maximum disappearance of plasmodia from the blood occurs within the first 24 hours, whereas with oral administration it takes place in the third 24 hours. But there is no evidence that actual disinfestation is more readily obtained by one method than with the other, while the potential depressant action of intravenous quinine has been amply proved in India by R. McCarrison and J. W. Cornwall and by U. N. Brahmachari. Moreover, if any of the drug spill into the surrounding tissues these will slough, whilst thrombosis, so well established as occurring after its injection into varicose veins, has been reported even in healthy ones. Thus the intravenous route should probably be reserved for cases in which speedy action is essential—e.g., when there are urgent cerebral symptoms or when a swarm of subtertian parasites in the peripheral blood presages their onset—or in which the stomach refuses to retain the drug. The quinine should be introduced slowly, in considerable dilution, and in moderate doses, guarded if necessary with adrenalin; the blood pressure should be closely watched, and administration must be strictly aseptic. Intravenous quinine may in this way with reasonable safety be made available for those few special conditions in which its value has been fully demonstrated.

Plasmochin in Malaria.

(Annual Report, United Fruit Co., Medl. Dept., 1927, p. 84.)

BASED on the clinical and laboratory data reported in the malaria section, and also on the work of a great many other observers, certain conclusions seem justifiable in regard to the results to be expected by the exhibition of quinine and plasmochin individually and in combination, in the treatment of malaria:

(1) Quinine is a specific against the schizonts of all types of malaria, and these are responsible for the clinical symptoms. In acute cases it is the drug of election; and in order to get prompt results, large doses must be given (2 to 3 grammes daily in divided doses). In pernicious and persistent cases, part or all of this must be given intramuscularly or intravenously, until the acute symptoms subside. Then oral administration suffices.

(2) In acute cases the exhibition of quinine for short periods favours for some unknown reason the appearance of gametocytes in the peripheral blood. This observation was made by Dr. H. C. Clark in his malaria surveys in 1926, and a preliminary report was published in the *American Journal of Tropical Medicine*, Vol. VII, January 1927. In explanation of this phenomenon, two hypotheses are submitted:

(*a*) That the exhibition of quinine determines the passage of the gametocytes from the deep viscera to the peripheral blood, or

(*b*) It creates an environment which favours the development of increased numbers of gametocytes.

This may be considered as Nature's method of self-preservation of the species, and is comparable to what

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

takes place in all forms of free-living unicellular life. When the nutritional conditions are favourable, multiplication takes places asexually. When the environment becomes unfavourable, the organisms, after conjugation, assume the cystic or resting stages until conditions are again favourable for their sexual multiplication. When malarial gametocytes in the peripheral blood are increased in numbers, mosquitoes are more readily infectible.

(3) Gametocytes developed under quinine administration are viable, as shown by Darling, Ross, Barber, and Wenyon.

(4) Plasmochin is mainly effective against gametocytes, and it also has a marked action in clearing the schizonts of the tertian and quartan types of malaria from the peripheral blood. On the schizonts of the æstivo-autumnal types, its action is negligible. It apparently does not prevent the development of blackwater fever. Moreover, it is not as effective in preventing relapses when administered alone as it is in combination with quinine.

(5) It appears, from the few observations made by Dr. Barber and Mr. Kemp to have a toxic action on the crescents, as, after a few doses, mosquitoes feeding on these individuals do not become infected. This observation is exceedingly important, and if it is confirmed, plasmochin must be considered of paramount importance in malaria control.

(6) If given in too large a dosage, or over a too prolonged period of time, plasmochin may cause toxic symptoms. In a small percentage of cases there appears to be an idiosyncrasy for the drug, and this is the case also with some people when taking quinine. The daily dosage should not exceed 0.06 gramme, and this should not be continued over a period exceeding 6 days, unless the patient is under the closest daily observation. Apparently doses in excess of this are not more effective against the parasites.

(7) The toxic symptoms take the form of headaches, giddiness, gastric distress, cyanosis, etc., and the drug may cause death. Clinical findings at the onset of toxic symptoms are leucocytosis and erythrocyte degenerations.

(8) The administration of quinine in combination with plasmochin apparently prevents the development of toxic symptoms, and because of this and the therapeutic action of the two drugs on the different phases of the parasites, they should always be given in combination in order to get the best clinical results.

(9) Our experience indicates that for an adult the amount of quinine to be given daily in combination with plasmochin depends on the clinical symptoms. In chronic cases without acute symptoms, 1 gramme daily will suffice. In acute cases, from 2 to 3 grammes daily are necessary in order to obtain optimum results.

(10) In ambulatory cases not under daily supervision, the daily dosage of plasmochin should not exceed 0.04 gramme, in combination with 1 to 2 grammes of quinine, for a period not to exceed 6 days; or 0.06 gramme plasmochin, with the same dosage of quinine, over a period not to exceed 4 days. Whenever possible, all cases so treated should return for a re-examination within from 3 to 4 days after the course is completed; and if parasites are still present, a second course of treatment is indicated.

(11) All ambulatory cases should be warned that if they experience headaches, dizziness, or gastric distress or if blueness develops in the face or lips, the drug should be immediately suspended, and that they should report to the physician for further instructions.

(12) If, on a thick-film survey, the camp population should be heavily infected, 60 per cent. or over, blanket treatment of the whole population is recommended, and the course of treatment should be administered in accordance with the dosage referred to above. Within from 3 to 4 days after the last treatment is given, the camp should be resurveyed; and if any cases are still found positive, another similar course of treatment should be instituted. It has been demonstrated that the heavily-infected carriers (frequently without acute symptoms) most readily infect mosquitoes, and that one heavily-infected mosquito may transmit malaria for 3 months at least. The importance of repeated surveys therefore, to discover and treat the carriers, cannot be too highly stressed, and it would be highly advantageous if this could be done during the dry season. This will prevent the high incidence of mosquito infection later on during the rainy season when conditions are more favourable for their multiplication.

Eight Years' Experience of Yatren in the Treatment of Amœbic and Bacillary Dysenteries and their Sequelæ.

By PROF. P. MUHLENS.

(*Lecture delivered before the International Congress for Tropical Medicine and Hygiene at Cairo,* December, 15th to 22nd, 1928.)

The treatment of Amœbic Dysentery with Yatren must in every case be adapted to the individual patient. We meet with instances in which prompt amelioration follows the administration of the drug *per os;* others, again, react quickly and with certainty only to treatment by *rectal injection;* lastly, there are yet others in whom *both methods* have to be employed in combination if we are to attain speedy and complete cure. The method to be employed depends in the main upon the *site of the amœbic ulcers:* that is, whether the upper or the lower parts of the large intestine (e.g., in ulcerative colitis) or both are involved. Manson-Bahr and others maintain that in every case of chronic amœbic dysentery the condition must be accurately determined from the point of view of treatment, and that among matters to be attended to, examination of the stools, and a *sigmoidoscopic examination* are of *paramount importance,* particularly in severe cases. If the results of fæcal examination are negative, we usually set up a provocative diarrhœa by stimulating the bowel with a dose of sodium or magnesium sulphate; by this means we often discover amœbæ which previously could not be found.

Anyone who does not try to determine accurately, *prior* to treatment, the chief site of the disease, that is, what part of the intestine is to be dealt with, and thereby direct the *form* of the treatment, is himself responsible for failure.

Failure can usually be explained by the fact that inadequate treatment has been given, owing in part to the fact that the diarrhœa which in certain subjects is produced by oral administration of Yatren had led to intermission of the course of treatment.

The *non-toxicity* of Yatren is generally acknowledged. Doses up to 12 gm. in the day have been prescribed and tolerated. Symptoms of intoxication following the administration have not been reported in the literature, although these are common in the case of emetine, etc.

In many individuals, especially those suffering from *acute* dysentery, the *oral* administration of Yatren may provoke a diarrhœa which, if excessive, is very debilitating, though it leads to no lasting mischief. For my own part, and others agree with me, I regard this as salutary in the therapeutic sense as causing a mechanical flushing of the bowel, provided that it does not become transformed into profuse diarrhœa in subjects already weakened by dysentery. In such cases, in the first place, oral administration of Yatren must obviously be prohibited, or the dose must be reduced.

It may be that those in whom Yatren provokes so profuse a diarrhœa are individuals with an idiosyncrasy for the iodine contained in Yatren.

The iodine is also probably the reason why the preparation is *relatively* expensive. In my opinion, if we take into account the shortening of the duration of treatment, of the loss of working time and the greater certainty of the results of treatment, the cost of a course of Yatren comes to less than treatment with emetine.

Furthermore, Yatren treatment has, since it was first introduced, already become considerably cheaper, in that the *therapeutically active doses* are now *very definitely*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

lower as compared with those at first recommended by us, without any depreciation of the results produced.

Whereas Mühlens and Menk recommended at the beginning that for oral treatment of adults 4 pills, each of 0.25 gramme, should be given thrice daily, numerous later experiences have shown that in most cases successful results can be obtained with 2 pills three times a day, and it is best taken after food.

The scheme for a course of Yatren in pills is now as follows:—

First day 1 pill thrice in the day, after food.
Second „ 2 pills „ „ „ „ „ „
Third „ 2 „ „ „ „ „ „ „
Fourth „ 2 „ „ „ „ „ „ „
Fifth „ 2 „ „ „ „ „ „ „

If this is well tolerated, then

Sixth day 3 pills thrice in a day, after food.
Seventh „ 3 „ „ „ „ „ „ „

For *after treatment*, on every fifth, sixth and seventh day for 3 weeks, 2 pills should be taken thrice daily *after* food.

Thus, for a full course of 100 pills suffice; 25 *gm. for a course per os.*

In the very acute cases of amœbic dysentery many authorities give, at the start, a few emetine injections in addition to the Yatren. The writer does not find any need for emetine, and usually adds *opium* with the object of getting rid of or modifying the irritative symptoms resulting from the oral administration of the Yatren.

In other cases of early idiosyncrasy prompt *habituation to Yatren* can be obtained by beginning with small doses (0.1) and gradually increasing (two or three times 0.1 gramme and so on). Even *in such cases treatment by rectal injections was practically always well tolerated.*

Treatment by rectal injection is *the method of* choice, above all in cases of chronic amœbic dysentery as also in the *sequelæ* of the disease, in particular *ulcerative colitis, membranous colitis, obstinate constipation*, and also perhaps in *sprue*.

Further, failure has again and again occurred in treatment by rectal injection when too high concentrations (up to 10 per cent., Birt) have been employed, for they are strongly irritant and are not retained in the colon.

Yatren injections which do not remain for at least 6—10 hours and which, consequently, are not absorbed, do not attain their object. The infusions of Yatren must be preceded by a thorough cleansing of the bowel by means of a high washout enema.

"Yatren 105" puriss must be *dissolved in water at 80°C. and should not be boiled.*

Of recent years, it has been customary to administer the high injections in the following dilutions and amounts by means of a long intestinal tube; First day: 1 gramme Yatren in 200 c.c. water; second day: 2 grammes Yatren in 300 c.c. water; third day: 3 grammes Yatren in 400 c.c. water; fourth day: 3 grammes Yatren in 500 c.c. water; fifth day: 3 grammes Yatren in 600—800 c.c. water, provided that these larger quantities of 600—800 c.c. are retained for at least 6 hours; sixth day: 3 grammes Yatren in 600—800 c.c. water; seventh day: 3 grammes Yatren in 600—800 c.c. water.

If there is difficulty in retaining the injections we add to the Yatren solution 25—30 drops of Tr. opii or reduce the quantity of water, giving 3 grammes of the Yatren in 300—500 c.c. water. It is advisable to give the injections *in the evening*, so that absorption by the bowel can take place during the night. In this way the injection method, as also the treatment by Yatren in pill form, can be carried out in patients who are *up and about* during the day; in every case the *subsequent treatment* should be repetition of the injections every fifth, sixth and seventh days for a period of 3 weeks in concentrations of 2—3 grammes Yatren in 300—500 c.c. water. Stronger concentrations are rarely needed to bring about definite cure of long-standing cases.

The astonishingly *high percentage of undoubted cures of amœbic dysentery* by Yatren has up to now been attained by no other mode of treatment, assuming that *these methods, or methods analogous to those which I have detailed to-day, adapted to each individual case, have been strictly carried out.*

The Use of Crude Oil as the Larvicide of Preference on the Isthmus.

By D. P. CURRY, M.D.

(*Proceedings of the Med. Assoc. of the Isthmian Canal Zone*, 1927, Vol. XV, p. 39.)

IN spite of the ever-increasing amount of drainage for the prevention of mosquito breeding in the Canal Zone, there yet remains in those places where it is impracticable to eliminate the water in which mosquito breeding may occur, a need for a larvicide that is safe, efficient, cheap, and easily applied. At one time much experimenting was done here to determine what substance was the best for that purpose, with the result that preference was given to two agents—the crude fuel oil of commerce, and a cheap resin-soap solution of crude carbolic acid. Because of rising cost of the ingredients of the carbolic acid solution, and of better methods of applying the crude oil, the use of the latter has for the past 6 or 7 years entirely superseded the use of the more expensive (and really less efficient) carbolic acid solution.

Fuel oil, as used for mosquito control on the Isthmus, is brought here in tankers from the oil fields of North or South America. From the ships it is pumped ashore into large steel or concrete reservoirs, and from these the oil is distributed by pumping through pipe lines to the small Health Department supply tanks located miles away on the lakeside, as conveniently as possible to the points of application. Delivered at the water's edge, ready to be drawn by gravity into the boat tank, the cost of the oil at the present time is $1.35 (Rs. 4) per barrel of 42 gallons, or less than 3¼ cents (2 annas) a gallon. Three men are required for its application; one to row or pole the boat along, one to work the pump, and one to handle the long pipe ending in a spray nozzle. The hot oil can be sprayed on the shore line as fast as the boat can be propelled and surface filming is positive and complete. Wind action and wavelets carry the oil into every nook and cranny, even to a considerable distance from the point of application. Fairly dense grass and other vegetation does not offer a serious bar to success. Inspection follows every oiling to determine if it has been done thoroughly, and if it is effective in destroying the larvæ. The results apparently could not be cheapened or improved by any other method that is as efficacious.

Elsewhere than in the lake areas, mosquito breeding is controlled chiefly by training of streams and by draining and filling. Some oiling is of course done in the open streams and ditches, especially in the dry season or at times of slight precipitation. What were formerly known as "oiling gangs" are now better described as "maintenance gangs," the use of oil becoming less and less each year. Such gangs now carry spades and rakes, as well as oil, and are instructed to eliminate by drainage or filling whenever possible, every bit of water that may prove a potential breeding-place within a controlled area.

The results of our methods of control and of the more recent extension of sanitation to greater distances from protected communities than was formerly the case, are shown in other ways than by malaria rates alone. Frequent observations are made both at nightfall and at dawn, with a view to determining what mosquitoes are on the wing. Whereas in earlier years such efforts usually resulted in catching many of the malaria-carrying species within the town sites, for the past two or three seasons such mosquitoes are only rarely so caught, and places where formerly they might always be found are now practically free from them. Of course this has not been a sudden occurrence following any particular year's work but really is the cumulative result of many years of progressive effort. In fact, were it not for the presence on the Isthmus in large numbers of two harmless, though very annoying species of mosquitoes, the public would hardly realize now that a mosquito problem exists. These two mosquitoes are *Aëdes tæniorhynchus*,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the banded salt-marsh mosquito, and *Mansonia titillans*, a mosquito of very similar appearance on casual examination but of very different breeding habits. Both are voracious biters and both fly long distances from their breeding-places.

Studies in Malaria, with Special Reference to Treatment.

Part XI.

THE CINCHONA ALKALOIDS IN THE TREATMENT OF BENIGN TERTIAN MALARIA.

By J. A. SINTON,
MAJOR, I.M.S.,
and
W. BIRD,
MAJOR, R.A.M.C.

(The *Indian Journ. Med. Res.*, January, 1929, p. 725.)

ALTHOUGH much scientific work has been done on the effects of the different cinchona alkaloids in the treatment of benign tertian malaria, most of it has had reference to the production of clinical cures and few such experiments have been made, in which the patients were observed by systematic blood examinations for the occurrence of relapses after the termination of all treatment. The methods considered necessary for testing the effects of any treatment in the production of a permanent cure in malaria have been detailed in another paper of this series.

The researches which have been carried out by different workers in recent years would indicate that, in as far as the reduction of fever and the rate of disappearance of parasites from the peripheral blood is concerned, the four common crystallizable alkaloids of cinchona bark, namely, quinine, quinidine, cinchonine and cinchonidine, have almost an equal value when administered in therapeutic doses to patients suffering from benign tertian malaria. If these same relative values should be found to exist when the alkaloids are tested for the production of a permanent cure of the disease, it would have a very important influence upon the present policy of cinchona cultivation. Quinine, however, still seems to be the drug of preference in the treatment of the malignant tertian type of the disease.

The results recorded in this paper have been obtained during 5 years of work on the anti-relapse treatment of malaria, and during that time over 1,300 patients suffering from benign tertian malaria have been treated with the different cinchona alkaloids.

Summary of Results.

It is seen from the figures given in the table that the results obtained after the treatment of chronic benign tertian malaria by quinine, cinchonine and cinchonidine were almost the same. It would, therefore, seem that in therapeutic doses these three drugs have an almost equal value. It must, however, be noted that the dosage of quinine was greater than that of the other two alkaloids. Whether the latter alkaloids would give better results, if they could be tolerated when administered in the same doses of quinine was not determined.

Quinidine was found to give a distinctly higher relapse rate than the other alkaloids tested. There was no evidence that it had a greater curative action in infections with *P. vivax* than had quinine.

Cinchona febrifuge treatment gave a slightly higher average rate than did quinine, cinchonine and cinchonidine, but showed a better result than quinidine.

Comparison of the Relapse Rates in Fresh and Chronic Infections.

The opinion formed by many workers during the Great War was that, in fresh infections with *P. vivax*, a much smaller percentage of relapses developed after treatment than in the case of the chronic relapsing ones. On the other hand, some workers, as Acton, Curjel and Dewey (1921), thought that fresh infections were not more easily cured than chronic ones.

It has been the experience of most workers in the tropics that few patients, unless subject to discipline, will conscientiously carry out the long courses of quinine treatment usually recommended for the cure of malaria. Even patients under strict discipline make efforts, sometimes successful, to escape from the tedium of this form of treatment. It is also extremely common, especially among uneducated persons, for a patient to take treatment only while clinical symptoms are present and then to abandon all treatment until a relapse occurs. Yet, in spite of this, very many patients treated for primary infections with *P. vivax* seem to be permanently cured by such curtailed courses, in the absence of reinfection. Such cures probably represent that proportion of patients whom it has been found possible to cure by short courses of quinine after experimentally-induced infections. If a considerable proportion of patients suffering from primary attacks were not cured by such short or incomplete courses, and relapsed subsequently, the number of malarial patients in tropical countries would be even greater than at present.

Although the view that fresh infections were more easily cured was believed by many workers, yet little scientific proof was forthcoming, because, until the introduction of malaria in the treatment of mental disease, almost all the systematically controlled researches into the anti-relapse value of the cinchona alkaloids had been conducted with chronic relapsing infections. This was necessary on account of the great difficulty in obtaining fresh infections in sufficient numbers under conditions suitable for carrying out careful work in the absence of reinfection.

As can be seen from the results obtained in this paper, such chronic infections are not comparable to fresh infections in their reaction to treatment. The former probably represent those patients who were inadequately

TABLE.

Alkaloid used.	Total patients.	Number lost sight of.	Number not relapsing.	Number of relapses.	PERCENTAGE OF RELAPSES.				
					Observed.	Possible maximum.	Observed minimum.	Average.	Deviation from average.
Quinine ..	667	66	184	417	69·4	72·4	62·5	68·0	− 3·2
Quinidine ..	208	14	30	164	84·5	33·6	78·8	83·0	+11·8
Cinchonine ..	72	3	22	47	68·1	69·4	65·3	67·6	− 3·6
Cinchonidine ..	107	24	23	60	72·3	78·5	56·0	68·7	− 2·5
Cinchona febrifuge	110	25	19	66	77·6	82·7	60·0	73·1	+ 1·9
TOTAL ..	1,164	132	278	754	73·0	76·1	04·7	71·2	...

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

treated during their primary infections or represent that minority which it has been found in experimental malaria are not easily cured of the disease.

James (1924), Manson-Bahr (1924) and Yorke (1925) all think that the difference in the susceptibility of induced malaria to quinine treatment has something to do with the fact that one is dealing with primary infections instead of with chronic relapses.

Of 25 known primary infections with *P. vivax* contracted in nature and treated with quinine for 8 weeks, only 1 or 4 per cent. relapsed. Among 154 patients, many of whom were fresh infections, the relapse rate due to *P. vivax* was only about 30 per cent. after a short course of quinine treatment (4 to 7 days), in spite of the fact that some of the relapses recorded may have been reinfections. The relapse rate was about 14 per cent. amongst 44 patients treated under similar conditions but observed mainly by clinical methods.

If all these cases are grouped together, although not all fresh infections, there is a total of 251 patients with a relapse rate of about 24 per cent. This figure is very close to the 25 per cent. obtained by James (1926) following the treatment of patients infected by mosquito bites experimentally.

On the other hand the relapse rate among 667 chronic infections treated with quinine averaged 68.0 per cent. and for 1,164 patients treated by different cinchona alkaloids was 71.2 per cent. These results are very similar to those recorded in the researches after the War.

These figures help to confirm the opinion of clinicians, strengthened by the results of the treatment of induced malaria, that the majority of fresh infections contracted in nature are more easily cured than are chronic relapsing ones.

Conclusions.

Under the conditions of our tests and with the dosage of cinchona alkaloids used, the following conclusions were arrived at regarding the relapse rates after the treatment of infections due to *P. vivax*.

(1) The percentage of relapses in a population suffering from fresh infections with *P. vivax* is much lower than the percentage among a population composed of chronic relapsing infections only.

(2) The quinine and alkali treatment seems to be more efficacious than quinine alone in curing fresh infections, but the results in chronic infections showed no very marked benefit.

(3) The four chief crystallizable alkaloids of cinchona bark—quinine, quinidine, cinchonine and cinchonidine—showed almost an equal value in preventing relapse in chronic infections. Quinidine gave the worst result.

(4) No evidence was found to confirm the assertion that quinidine was more effective than the other alkaloids in the treatment of infections with *P. vivax*.

(5) Cinchona febrifuge has a value which, for most practical purposes, seems equal to that of the pure alkaloids in the treatment of chronic infections.

APPENDIX A.

Prescriptions of Mixtures used in Treatment.

(1) Quinine sulphate .. .. grains 10.
Acid sulphuric dil. .. .. minims 10.
Water to .. .. ounce 1.

(2) Similar to No. 1 but magnesium sulphate, 60 grains, was added to each ounce.

(3) Quinine sulphate .. .. grains 10.
Acid citrici .. .. grains 25.
Magnesium sulphate .. .. grains 60.
Water to .. .. ounce 1.

(4) Similar to No. 3, but without magnesium sulphate, and with 12 grains of quinine to each ounce.

(5) Quinidine sulphate .. .. grains 10.
Acid sulphurici dil. .. minims 10.
Water to .. .. ounce 1.

(6) Quinidine sulphate .. .. grains 10.
Acid citrici .. .. grains 25.
Magnesium sulphate .. .. grains 60.
Water to .. .. ounce 1.

(7) Similar to No. 5 but quinidine sulphate was replaced by cinchonine sulphate or cinchonidine sulphate in the same dosage.

(8) The same mixture as in No. 5 except that quinidine was replaced by cinchona febrifuge in the same amounts. The mixture was strained through lint to obtain a nicer preparation.

The following mixture was also given before each of the mixtures shown above in some instances.

Sodium bicarbonate .. .. grains 90.
Sodium citrate .. .. grains 45.
Calcium chloride .. .. grains 5.
Water to .. .. ounces 2.

Some of the mixtures used contained various flavouring materials to disguise the taste.

REFERENCES.

Acton, H. W., Curjel, D. F. and Dewey, C. O. (1921). *Indian Journ. Med. Res.*, Vol. VIII, No. 4, pp. 853—871.

James, S. P. (1924). *Trans. Roy. Soc. Trop. Med and Hyg.*, Vol. XVIII, pp. 33—36.

James, S. P. (1926). *Trans. Roy. Soc. Trop. Med. and Hyg.*, Vol. XX, No. 3, pp. 143—157.

Manson-Bahr, P. H. (1924). *Trans. Roy. Soc. Trop. Med. and Hyg.*, Vol. XVIII, p. 41.

Yorke, W. (1925). *Trans. Roy. Soc. Trop. Med. and Hyg.*, Vol. XIX, No. 3, pp. 108—122.

Swimming Baths.

(Abstracted from *The Medical Press*, January 16th, 1929, p. 49.)

OFFICIAL attention has been directed to the dangers arising from the public swimming baths in Paris, these being subject to regulations requiring frequent renewal of the water and cleansing of the bath. The habit of afternoon bathing has much increased of late, and many of the large establishments of various kinds have provided baths in which, after taking a plunge, the bather sits in bathing costume in the adjoining café and partakes of refreshment. Some of these baths are said to be used by from 1,200 to 1,400 persons daily, though they contain only 700 cubic metres of river water, renewed but once a week. Under such conditions various diseases may be contracted, such as conjunctivitis, inflammation of the throat, nasal fossæ, and Eustachian tubes, and gastro-intestinal disorders; for bacteriological analysis of the water shows that it rapidly becomes contaminated with innumerable species of micro-organisms. A rough method of recognising the degree of contamination, as used in Paris, is the filtration of five litres of water under pressure through discs of white flannel, the foreign matter retained being collected and analysed. The health authorities may order the more frequent renewal of the bath water, or its filtration or sterilisation by Javelle liquid (hypochlorites). The method of examination adopted by the London County Council consists of counts per cubic centimetre of the bacterial colonies, obtained after forty-eight hours' plate culture on agar at 37°C. from 0.1 to 0.5 cubic centimetres of the water; and includes tests for the presence of *Bacillus coli communis* in samples of from 1 c.c. to 10 c.c. The standard adopted by the Bathing Committee of the American Public Health Association requires that: (*a*) not more than 1,000 organisms in twenty-four hours' growth at 37°C. shall be found in more than 10 per cent. of samples; (*b*) not more than two out of five samples of 10 c.c. on the same day shall show the presence of *B. coli*. The swimming baths within the jurisdiction of the London County Council appear to have answered adequately to the required tests, but without the reports of the various local authorities of the large provincial cities and towns there is no means of gauging the efficiency of the supervision exercised by them. The matter is one to which their careful attention should be directed.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Ophthalmological Notes.

(Abstracts from *American Journ. of Ophthalmology*, December, 1928, Vol. II, p. 1007.)

Angelucci, A. Autohemotherapy and iontophoresis in ophthalmology. *Arch. di Ottal.*, 1926, Vol. 33, Oct., pp. 439—463.

IN trachoma the author uses parenteral injections of five to ten cubic centimetres whole blood with one-half to one cubic centimetre or serum given subconjunctivally. He reports good results, especially in cases with corneal complications. In incipient cataract he claims good results from iontophoresis with an iodide solution.

Blatt, Nicholas. Interference in ocular diseases. *Graefe's Arch.*, 1928, Vol. 120, p. 335.

As examples of the well-known beneficial action of intercurrent disease, the author gives in brief the history of a number of his cases with primary ophthalmic disease affected favourably by other disorders. In three cases of parenchymatous keratitis, one was much improved by an attack of scarlet fever, another by diphtheria, and a third through angina and tonsillitis. An attack of phlegmon of the eyelids apparently cured a case of long-standing chronic catarrhal conjunctivitis, the onset of acute purulent conjunctivitis cured another, and influenza a third case of chronic catarrhal conjunctivitis. An attack of scarlet fever stopped the activity of a herpes corneæ, anthrax that of an ulcerative blepharitis, and gonorrhœal corneal ulcer that of a syphilitic uveitis. Among seventeen cases of tabetic optic atrophy treated with malaria, according to Wagner-Jauregg, in four the process was checked and the vision brought to a standstill.

Braunstein, N. Treatment of eye diseases by means of ultra-violet rays. *Zeit. f. Augenh.*, 1928, Vol. 65, July, p. 232.

A BRIEF report of treatment of nineteen cases of ulcus serpens, eleven of tuberculosis, fifteen of phlyctenular conjunctivitis, six of herpes corneæ and four of old corneal opacities. In all these classes of case the author notes striking improvement as a result of this form of treatment which is neither dangerous nor difficult.

Demaria, E. B. Treatment of tuberculous lesions of the eye with minute doses of tuberculin. *Arch. de Oft. de Buenos Aires*, August, 1928, Vol. 3, p. 539.

THE author reviews the various applications of tuberculin, from Koch up to the present, along with theoretical conceptions upon which changes in the original technique are based. The method he employs at present was instituted by Viton of Buenos Aires, and was presented during 1923 in a book entitled *Tuberculin Therapy*. The minutest doses of tuberculin are recommended both for diagnostic and therapeutic purposes.

A general resume of the Viton method of employing tuberculin in contrast with that of Koch is distinctly in favour of the former as to the patient's general condition. The Viton technique uses four strengths in which the tuberculin is diluted with physiological saline solution up to a strength of one part to 9, 10, 11, and 12 zeroes respectively. Where the patient is very susceptible to its effects, this is carried still farther, even up to 25 zeroes.

Elkes, C. Besredka's bacteria-free filtrates and their therapeutic use in diseases of the eye. *Zeit. f. Augenh.*, 1928, Vol. 65, June, p. 135.

IF ten-day broth cultures of staphylococcus are filtered and sterilized by heat, one obtains a culture medium in which other organisms grow freely but in which staphylococcus grows poorly or not at all. To explain this an antivirus, thermostable in contrast to the thermolability of the virus, is postulated, by analogy with antiferments which develop in certain cells, as for instance leucocytes. In a small series of cases—hordeolum, chronic dacryo-cystitis, conjunctivitis—rapid healing followed repeated application of antivirus to the mucous membrane of the conjunctival or lacrimal sac.

Tsykulenko, K. J. Omitting the eye dressing in post-operative care. *Russkii Opht. Jour.*, 1928, August, pp. 263—266.

THE author is in favour of the "open" treatment of operative cases. In sixty-seven cases of intraocular operation, of which twenty-eight were cataract extractions, dressings were completely omitted in the post-operative period. A wire mask similar to Fuchs's was used for the protection of the operated eye. No ill results followed.

Bolkmann, Gunther. Treatment of ocular diseases with a new non-specific fever-producing substance (pyrifer). *Zeit. f. Augenh*, 1928, Vol. 65, May, p. 10.

PYRIFER consists of protein from a non-pathogenic bacterium, and was first proposed as a harmless substitute for the malaria treatment of parasyphilis. The author used it in acute infections of the cornea and uvea, in injuries, and in two cases of syphilis and parasyphilis of the eye.

He found it effective in cases where milk was effective, namely, in fresh inflammatory lesions, and it was sometimes effective after milk reaction had become exhausted. The reaction was severer and more unpleasant than after milk. The remedy was not tried in gonorrhœal infections.

Professional Etiquette.

(*The Lancet*, January 19th, 1929, Vol. CCXVI, p. 145.)

THE recently published rulings of the General Council of the Bar upon doubtful points of etiquette and conduct are of interest to other professions. Two points in connection with advertisement are specially dealt with. A barrister inquires if there is any objection to his broadcasting a short course of popular lectures on general topics of law with the usual insertion of his name and short particulars in the *Radio Times*, and the description "barrister-at-law." He also asks—with a courage which will shock the older generation of barristers strictly trained in circuit discipline—whether his photograph may appear in the B. B. C.'s quarterly "Talks and Lectures." The General Council of the Bar answers that he may broadcast the lectures as given by a "barrister-at-law," but that his name, address, and photograph must not appear. Thus novel wireless developments have raised an old issue afresh; few barristers can have had any doubt as to how the Council would decide. The decision is in keeping with the long-established principle forbidding a member of the Bar to advertise himself by articles under his own name on legal topics in popular journals. Specialist articles in specialist publications like the *Law Quarterly Review* are, of course, on an entirely different footing. The second point of this nature dealt with by the Bar Council's Annual Statement for 1928 is the answering of legal questions by barristers in newspapers. Here the Council republishes a former "warning notice" which it has caused to be displayed also on the screens of the libraries and common rooms of the Inns of Court during the past year. The notice observes that the Council's attention has been called to the increasing practice of legal journals advising or professing to advise their subscribers on points of law arising in actual practice. It mentions a recent instance where a firm of publishers has offered free advice on conveyancing matters to all subscribers to one of its publications. The Council has no means of knowing whether such advice is supplied by members of the Bar, but it believes that in some cases the advice is represented to the client as being "counsel's opinion." It reaffirms its former rulings and declares unequivocally that it is contrary to professional etiquette for a barrister to answer legal questions in newspapers or periodicals, whether for a salary or at ordinary legal remuneration: (1) where his name is directly or indirectly disclosed or liable to be disclosed, or (2) where the questions answered have reference to concrete cases which have actually arisen or are likely to arise for practical decision. A barrister inquired if the Council would give any further guidance

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

by defining more narrowly the reference to "a particular question likely to arise for practical decision." Not to be drawn into hypothetical cases, the Council replied that it was a matter for the discretion of the barrister himself. That final answer counts for much in these cases of doubt. If a professional man knows that certain forms of self-advertisement are illegitimate and contrary to the accepted traditions of his fellow-practitioners he can refrain from treading close to the borderline. Every profession has its members who sail close to the wind; their colleagues know them and form their own opinion. In this matter of advising on technical questions in journals the legal profession has probably had some increased demand or opportunity lately in view of the revolution in the law of conveyancing and real property which has sent back to school again many men of long experience and adequate instruction in the older law. The medical profession is here not quite in the same position as the legal. Advice upon health is a personal matter; the patient must be seen by the practitioner, whereas in many cases a barrister might be able to give an opinion—upon the interpretation of a clause, for instance, or upon the inference to be drawn from correspondence—without an interview. Moreover, questions of health are usually more urgent than questions of legal rights; a patient may be unwilling to wait a week for the printed reply. In other respects there is no great difference between the official standards of the Bar Council and the General Medical Council. In both professions there will be members, junior as well as senior, who are a law unto themselves. The standards cannot be upheld unless they are supported by the general approval of the rank and file. If they have that approval they are entitled to the loyal obedience of all.

Influenza.

(Abstracted from *The Medical Press*, January 23rd, 1929, p. 68.)

DURING the last few weeks a very rapid spread of influenza was reported from the United States of America and Canada, suggesting that a European visitation is probable, and a world pandemic by no means impossible. Previous pandemics have occurred in 1803, 1833, 1847, 1890, and 1918-19, the last being answerable for the greatest mortality ever recorded for any epidemic disease in England since registration commenced, and for more deaths and disablement than the Great War. In June, 1918, influenza made its appearance, and, continuing through July, was followed after a short interval by a second wave of prevalence in the three last months of the year, and by a third in February and March, 1919. The summer epidemic was comparatively mild—the mortality was just over 29 per 100,000 population—but the subsequent waves were characterised by more severe symptoms and a tendency to pulmonary complications, and the mortality rose to 269 per 100,000 in October-December, 1918, falling to 104 per 100,000 in February-April, 1919. In some of the great towns of England the death-rate exceeded 400 per 100,000; from June, 1918 to May, 1919, the deaths in England and Wales numbered 151,446, and in India alone more than six millions perished. The predilection was for middle life rather than for the extremes of age; the largest proportion of deaths occurred in persons under forty-five years, a characteristic which has not been observed since.

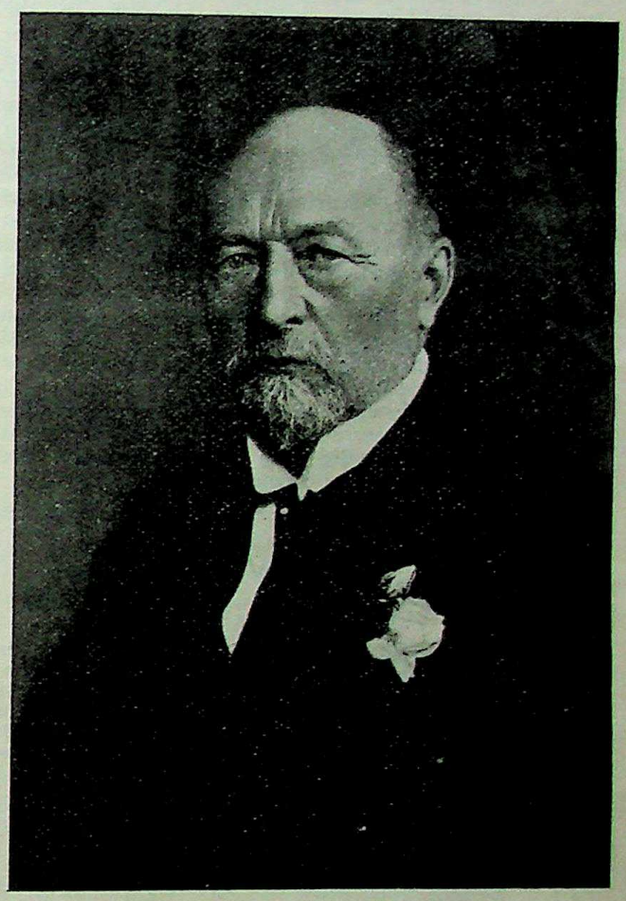
The usual complications of influenza are pulmonary or cardiac, pneumonia being one of the commonest, and to these death is generally due; but in these fatal cases the intervention of some microbe, not specifically associated with influenza, is usually demonstrable, the invasion of which is favoured by the already lowered resistance caused by the infection. Theories as to the periodicity of epidemic influenza postulate, in one case an interval of thirty-three weeks (Brownlee), or in another (Spear) a recrudescence at equal intervals before and after the thirty-fifth week of the year; but neither is invariably true nor enables the degree of serverity to be foretold.

Influenza is already among us again—it is useful to remember its former ravages—and it is the duty of the public authorities to take steps to lessen the opportunities of infection, to assist in treatment and nursing, and to mitigate the severity of the hardships arising from the simultaneous attack of various members of the same household. In like measure it is the interest of the individual to take every precaution against infection, and if he be already infected, it is incumbent upon him to prevent himself from infecting others by unguarded coughing and sneezing.

Emil Von Behring.

MARCH 15th, 1929, was the 75th anniversary of the birth of Emil von Behring. His work as a pioneer on serum therapy is well known, but a short note on his life and work may perhaps prove of interest.

Son of a large family—the father was a teacher in Hannsdorf near Deutsch-Eylau, Western Prussia, he learned early the hardship of earning his living. With 12 children the father saw no way to afford a high-school education for this boy, who yet early showed a liking for medicine.



His intelligence, however, won him the favour of his teachers and they procured him a scholarship at the high-schools.

At 20 years of age, he entered the Military Medical Academy at Berlin, which he left at the age of 26 years after having been admitted a doctor.

He now joined the German Army as a military surgeon. He showed a strong inclination for scientific research and a surprising ability for observation.

In 1882 he formulated an entirely new theory of the action of bactericidal mediums and laid the foundations of his subsequent pioneer work on blood-serum therapy.

He gave up his military career, became a scientist, carried through his experiments under trying economic conditions and finally published in the winter 1890 his epoch-making discoveries in blood-serum therapy, namely, that the blood-serum of animals recovered from a disease has the power to cure another animal affected by the same disease.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The practical application of this theory led him to the discovery of anti-diphtheria serum.

The rate of diphtheria casualties fell wherever physicians applied diphtheria curative serum, humanity was freed from a most cruel scourge that hitherto had decimated its children.

Here it should be mentioned also, that already in 1890 Behring, in collaboration with Kitasato, had prepared anti-tetanic curative serum, the value of which equalled that of the anti-diphtheria serum.

Besides these problems he devoted a considerable part of his life to the study of tuberculosis.

Numerous honours were bestowed upon him. The "Institut de France" and the "French Academie de Medecine" in 1890 presented with him honoraria of 50.000 and 25.000 frs. The French Government followed with the appointment as officer of the Legion of Honour. England distinguished him by the honorary membership of the "Royal Institute of Public Health," the latter bestowing upon him the "Harben medal." The King of Italy decorated him with the Cross of the Commander of the Order of the Italian Crown. Besides other important Italian scientific corporations, the "Reale Societa Italiana" made him an honorary member. In the United States of America he became honorary member of the "American Academy of Arts and Science" and the "New York Academy of Medicine." Austria-Hungaria, Russia, Turkey, Roumania, Sweden, Belgium and other nations made him an honorary member of their most distinguished scientific societies. The Universities of Athens and Mexico conferred upon him the degree of "doctor honoris causa." The Sultan of Turkey presented him with the order of Medjidiji, 1st class, and Roumania with that of Meritul Sanitar, 1st class. In 1901 he was the first recipient of the Nobel Prize.

In recognition of his scientific achievements the German Emperor raised him to the hereditary peerage. In 1903 von Behring was nominated "Wirklicher Geheimer Rat" with the title "Excellency."

In March 1917 he died at the much-too-early age of 63 and his remains were buried in a mausoleum near Marburg-Lahn, surrounded by a peaceful landscape and close to his creation, the Behringwerke.

Reviews.

ASPECTS OF AGE, LIFE, AND DISEASE.—By Sir Humphry Rolleston, Bart., K.C.B., M.D., Hon. D.Sc., D.C.L., LL.D., Regius Professor or Physic in the University of Cambridge. London: Kegan Paul, Trench, Trubner and Co., Ltd., 1928. (The Anglo-French Library of Medical and Biological Science.) Pp. 304. Price, 10s. 6d. net.

WE wish that we could convey to our readers something of the delightful humour and yet sound professional advice conveyed to the medical profession in this charming collection of essays and addresses by one of its most outstanding and honoured exponents; the best equipment for a successful general practitioner, we are told, consists of "one-quarter *savoir*, and three-quarters *savoir-faire*." He will find the "three-quarters *savoir-faire*" in this volume. Further, it is studded with delightful literary and classical quotations, apposite, entertaining, and wholly to the point. We read through the volume in an evening with intense enjoyment, and we can recommend to medical men in search of literature for a leisure hour no finer fund of common sense and humour. It deserves to become a classic.

The essays and addresses included deal with no less than thirteen different subjects and aspects of medical interest; they cover a very wide field, and are consequently difficult to review. The first concerns old age and longevity. And here we are told the authentic story of old Thomas Parr of Winington, Shropshire, who died at the age of 152 years. He first married at the age of 88; then begat two children; then was involved in matrimonial complications—for which he had to do penance in his village in a white sheet—at the age of 105. At the age of 122 he married again, a second time, a widow. In 1635, at the age of 152, he was sent for by King Charles I who desired to see this ancient of days in person. This proved to be the old man's undoing; he lodged in London with the servants of the Earl of Arundel, and died of a plethora from drinking wine. William Harvey, the discoverer of the circulation of the blood, performed the post-mortem examination and reported that the organs were essentially healthy and that no lesion could be discovered other than the plethora induced by the rich living in London to which the deceased was unaccustomed. Truly, a wonderful life, lived out literally to the full. Unfortunately Thomas Parr did not survive to the present age to be the counsellor of the youth and age of to-day; he would have been a wonderful asset to a British Cabinet. In passing, we need not dwell on the cases of a Hungarian couple, Johan Roven and his wife Sarah, whose married life lasted for 147 years, and who died at the ages of 172 and 164 years respectively; had they been living to-day, surely they would have been appointed as special consultants to the Divorce Court.

The author gives a most interesting summary of the factors affecting longevity, as well of the fallacies in assessing the true age. In addition to environmental and personal factors, heredity is of great importance, and the upshot of the matter is that a child should exercise the utmost care in selecting his parents and grandparents. In spite of Maeterlinck's wonderful vista of future generations in his *Bluebird*, we fear that the advice is to-day impracticable! People in the country in general live longer than those in towns, whilst worry is the chief enemy of old age; "fresh air, meagre food, freedom from care" constitute the essential factors in a healthy and vigorous old age.

Chapter II deals with historical instances of disease in celebrated persons, and their effects on history. The "glory which was Greece" was extirpated by malaria; whilst in the Middle Ages many cases of natural sudden death were probably wrongly attributed to poisoning. Is genius allied to mental instability, or otherwise? Was eyestrain the cause for the sudden discontinuance of the fascinating diary of Samuel Pepys? What was Napoleon's pituitary condition, and was his failure at Waterloo due to *petit mal*, on-coming gastric carcinoma, or (to ascribe a more vulgar cause) an attack of inflamed piles? What is the value of the *spes phthisica* in literature, art, and music? Was the Franco-Prussian war of 1870 precipitated by the fact that Napoleon III suffered from vesical calculus? One is driven to wonder what was the exact condition of Cleopatra's endocrine glands, and how any abnormality in them might have affected the course of history. But enough has been said to show the fascination of such studies in historical medical lore.

Chapter III deals with diseases as described by medical men who themselves suffered from them, again a field rich in interest and speculation. We believe that it was Sir Thomas Sydenham who wrote that he was, as far as he knew, the first patient to be attended by ten doctors who had survived,—a case not entirely dissimilar from that of the recent illness of H. M. the King-Emperor. Here Bright, Addison, and Hodgkin—the great triumvirate of Guy's Hospital—are the most outstanding names. Mark's study of acromegaly was the result of looking into his own facies for 15 or 20 years every day when he shaved or brushed his hair. Migraine has been described by many medical sufferers from the disease; asthma by others, including laboratory workers who have striven to solve the perplexing ætiology of this symptom-complex. Gout is the bane of the medical profession, the most notable sufferer being Thomas Sydenham, whilst Benjamin Franklin also wrote a thesis on the same subject from the point of view of a patient. (Unfortunately Sir Humphry Rolleston does not describe modern surgery from the medical patient's point of view, but the reviewer—

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

writing from personal experience—can inform him that such a section is badly wanted in this chapter; it would teach the young surgeon a very great deal if he had to undergo a major operation on his own person!) Sir James Mackenzie, who died of angina pectoris, is an example of a man who devoted the whole of his long professional life to studies on the action of the heart. Tuberculosis, of course, has been described by a considerable number of medical sufferers from the disease. Rupture of the tendo Achillis led Alexander Munro of Edinburgh to record his accident, and a similar condition, sustained whilst dancing, led John Hunter in 1768 to carry out experiments on dogs with regard to the healing properties of this tendon; (the results of these experiments should certainly be re-published at the present day—or, possibly, newer experiments might be instituted to conform to more recent methods of dancing, and injuries to the extensor as well as flexor tendons of the foot studied). Percivall Pott's fracture, due to a fall from a horse, has kept his name for ever memorable in surgical literature.

"Clinical variations in disease from the historical point of view," constitutes one of the most important and thoughtful essays in the volume. Here this important subject is well dealt with, but in all too brief a fashion; it is one on which much more information should be collated from a wide variety of sources of information. (A special feature of the book is the inclusion at the end of each chapter of chosen selected bibliographies; these will be of special value to serious students who wish to follow up the literature on the subjects concerned.)

Chapter V deals with the same subject, "changes in the clinical aspects of disease" from the historical point of view. Scarlet fever is probably the most typical instance; once a most dread disease, it has now become almost innocuous. A second is alastrim—if this is, indeed, but a mild variant of small-pox. On the other hand, readers of this journal will recall the terrible experience of India with regard to influenza in 1918-19. Beginning in August 1918, as a mild epidemic infection in Bombay and the adjacent districts, about six weeks later it assumed wide prevalence and an intensely fatal form: it swept the peninsula of India for some twenty-four months and caused some seven million deaths, often affecting villages situated in remote jungles or hill ranges, almost cut off from human intercourse. The study of this problem is one which demands careful attention. At the moment of writing (February, 1929). Europe is again in the grip of epidemic influenza; will this mean a new and terrible pandemic in India this year, or will the hot weather of 1929, with its high atmospheric temperature prevent the widespread dissemination of the disease? In India to-day, we are forewarned, but we are not forearmed. The different virulence of syphilis in different communities is again a subject of comment in the book, and has been much commented on in medical journals in recent years.

Chapter VI, "Medical Aspects of Holidays"—is one which both the layman and the medical man should read. Some people never take holidays, and seem to get on very well without them; others take too strenuous holidays, and subsequently wish that they had not; a third group—and this especially applies to medical men—are too wont to take a busman's holiday, and spend it in medical study at some foreign centre. We agree wholeheartedly with the author that the weekly Sabbath should be observed by the doctor as a complete holiday; let him disconnect his telephone on this one day of the week, close his consulting room, and open no letters or journals. A sea-voyage is almost the ideal form of holiday, for it enforces the conditions of absolute rest, freedom from professional worries, and absence of correspondence which should accompany a real holiday; but let the doctor travel as "Mr.", and never "Dr."; or he may be worried to death on board ship.

The medical aspects of tobacco come for consideration in chapter VII. We have already abstracted this address *in extenso**, so need not return to the subject again. Those of us addicted to the noxious weed will do Sir Humphry Rolleston the justice of saying that we are not really terrified after reading his address upon the subject. We know that it affects the nervous system, the heart, and may induce amblyopia; but we also know that it conduces to mental satisfaction, to a calm and contended mind, that no after-dinner speeches could be made without it, and that to-day women are almost as much addicted to smoking as men. It must be left for future ages to decide whether smoking will have that terribly deleterious effect upon the race that the "antis" in America, having (?) abolished alcohol, now predict for the effects of tobacco. To quote our author—

"To smoke or not to smoke, that is the question,
Whether a mild cigar assists digestion,
Or whether it begets a kind of quaintness."

Anyhow it is an ancient rite, not unassociated with the "pipe of peace," and goodwill among men. (Again, the reader who is interested, will here find a useful bibliography to the subject under discussion.)

"Professional careers," (chapter VIII), is an address to medical students at King's College Hospital in 1926. We would recommend every medical student to study this address, for it is an impartial and frank setting out of the whole subject: there are pros and cons since the War; the practice of medicine does not often lead to wealth, but it does lead to a life of absorbing interest and of ultility to one's fellow men. Chapter IX, "the meaning and methods of success," is almost an expansion of the previous chapter. It is wholly delightful to read, full of aphorisms and apposite quotations,—full, too, of commonsense. In this address we consider that Sir Humphry Rolleston has reached the happiest vein, and we regret that we cannot quote from it at length. A phrase, perhaps, may sum it up; the *patient* is as important as the disease from which he is suffering; and if you neglect the former in the interests of the latter, your practice is doomed. Even though a fellow human being is suffering from disease, he still remains (until he is dead) one of our human fellow sufferers; this should not be lost sight of. The rule is "put yourself in his place." Finally—and very important—is the lesson that the medical man must keep himself fit; he must take his regular exercise, enjoy social amenities, live a life which is not utterly bounded by his professional interests alone.

Chapter X discusses the problem of lady doctors. Lately their numbers at the medical schools in Great Britain has tended to decline, and Sir Humphry Rolleston frankly discusses the reasons for this. On the other hand—and in India in particular—the demand for them is almost insatiable. But there are certain drawbacks—chiefly casualties due to marriage. (We recall that a recent statistical investigation amongst the causes of casualties amongst the nurses at the Presidency General Hospital, Calcutta, led to a similar deduction: *the* trouble about the competent lady doctor or well qualified nurse is that some selfish male creature carries her off into the trammels of matrimony without considering how her patients, both present and future, may be concerned.) Thirty per cent. of lady doctors marry after qualifying, and are thus lost to the profession. It is all very well for the "stronger sex" to claim that she has equal rights; the cardinal trouble is that she surrenders them at the claim of the more insistent one. Our author claims that medical women are more intuitive than medical men, but perhaps less logical, less qualified to follow out a clue to its destination, "to search and study out the secrets of nature by way of experiment." They are more hard working students than the males, but perhaps they are less blessed with the sense of humour.....We do not know.....in brief, we do not presume to do so.

---

* *I. M. G.*, Dec. 1926, p. 617.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Chapter XI deals with irregular practice and quackery. It deals chiefly with the subject from its historical aspect, and this chapter should be read by every medical man; it is most intriguing, most humorous, most admirably put together. Perhaps the most illustrious of all quacks was George Berkeley, once Bishop of Cloyne, admittedly one of the most accomplished, learned, and wisest of men, who advocated as a universal panacea to avert and cure all evils a decoction of water with which tar in the proportion of a quart to a gallon had been mixed, and after two days the resulting supernant fluid was drained off and swallowed *ad lib.* Quacks accredited to Royalty in earlier days present an interesting picture; we can only thank Heaven that H. M. the King-Emperor was treated during his recent and extremely critical illness by fully qualified medical men, amongst whom the author of this book, Sir Humphry Rolleston, was prominent; had His Majesty been treated by quacks, or even by medical men whose science was ten years out of date, we venture to believe that he would not have recovered. It was modern scientific medicine, and not some ancient system of pseudo-medicine, or some pseudo-modern "system" of "therapeutic" that accomplished the marvel,—for it was nothing less.

Chapter XII is devoted to "poetry and physic." Again, it is wholly delightful to read. Medicine has always attracted the poets; and the poets, medicine; though Shelley deserted the former for the latter. "Can a doctor be a poet?" asks our author. We do not know, but we doubt it; the doctor deals too much with reality to enter into the realms of imagery. Of course doctors have been poets—but usually either bad doctors, or bad poets. Keats in one of the most exquisite of England's song-birds, but he was no doctor; he took his L. S. A. in 1816, but never practised. Goldsmith may have had a medical qualification (the matter is doubtful), and even Conan Doyle deserted medicine as soon as he could, and "deserted the correction of astigmatism and errors of refraction for the detection of hypothetical crime." Sir William Osler was not a poet, but he stands out for ever as a man who combined the most perfect and polished English prose with the practice of medicine.

Chapter XIII of the book deals with the medical aspects of Samuel Johnson, and is a brief but adequate summary of the many illnesses from which that wonderful cynic suffered. Samuel Johnson suffered, amongst other complaints, from œdema of the legs and scrotum. On the morning before he died he performed venesection on himself, withdrawing some ten ounces of blood. This was apparently too much for him, for he was very debilitated, chiefly from the effects of asthma. The post-mortem was conducted by Dr. J. A. Wilson, who was Johnson's medical attendant in his fatal illness, and who had been requested by the latter to carry it out. Details are given in this chapter, quoted from the original records of 1784. Chronic interstitial nephritis would appear to have been the real cause of death, associated with high blood-pressure. "My diseases" once remarked Johnson, "are an asthma, a dropsy, and what is less curable, seventy-five." It is a terse summary which is applicable to many and many a case seen in present day medical practice, nearly a century and a half later.

* * * *

We have tried to convey to the reader—and, we fear, at some length—the historical, clinical, and professional interest of this book. It is one written by one of the most famous of present-day British physicians, a successor to the Regius Professorship of Medicine at Cambridge of Sir William Osler, and one on whom the latter's literary as well as professional mantle has descended. We can only hope that our readers will enjoy the reading of it as much as we did ourselves. It is a notable contribution to the philosophy of medicine.

R. K.

MEDICINE MONOGRAPHS. VOLUME XIV, EPILEPSY.—By William G. Lennox and Stanley Cobb, London: Baillière, Tindall & Cox, 1928. Pp. 197, with 3 tables and 14 figures in the text. Price, 16s. net.

VOLUME XIV of the well known series of *Medicine Monographs* is devoted to a consideration of the syndrome epilepsy; the preparation of the monograph has been entrusted to Drs. Lennox and Cobb, of the Harvard Medical School.

The first portion of the book comprising some 25 pages is devoted mainly to a consideration of the neurological mechanism of convulsions, with special reference to the different theories of causation. The conclusion is reached that none of the theories in question—the irritative, the release, the short circuit, or the explosive,—is by itself satisfactory, and that probably all seizures result from combination of two or more of these mechanisms. The rest of the book is taken up with a discussion of the factors involved in convulsions. In no other disease condition possibly have so many diverse aberrations in bodily function been arraigned as ætiological factors; physico-chemical changes in the nerve cells, psychogenic causes, abnormalities in the circulatory, gastro-intestinal and sympathetic nervous systems, in the ductless glands or in the acid-base equilibrium of the body, all have had their day. The authors of this monograph present the claims for each and all of these various factors, together with the experimental data bearing thereon, in an admirably comprehensive and lucid style. A short summary at the end of each section is of considerable assistance in crystallizing the reader's ideas on what has immediately preceded, while the whole subject is excellently recapitulated in the last six pages of the book under the heading "general conclusions."

In the present state of knowledge (or lack of it) Dr. Lennox and Dr. Cobb have said what is essentially the last word on the subject of the syndrome epilepsy, and their manner of presenting the facts, separating the essential from the unessential, the data of value from the haphazard and casual observation, the wheat from the chaff, might well be imitated in other fields. Mention should also be made of the comprehensive bibliography containing over six hundred references together with authors' and subjects' indexes.

Of actual errors, the reviewer detected only two both of printing-room origin. On p. 34, line 2, "sensiblity" should read "sensibility" and on p. 63, line 9, "in often times" should be "is oftentimes." The general get-up of the book is good and in view of the excellence of its contents the price is not excessive.

J. M. H.

A HANDBOOK ON DIABETES MELLITUS AND ITS MODERN TREATMENT.—By J. P. Bose, M.B. (Cal.), F.C.S. (Lond.). Calcutta: Thacker, Spink & Co., 1928. Pp. 192, with 1 colour plate and 7 charts. Price, Rs. 5.

WE believe that this little handbook will prove invaluable to medical practitioners in India, and especially to those in Bengal, in which Province diabetes is so prevalent. It has a foreword by Col. J. W. D. Megaw, I.M.S., and is dedicated to the memory of the late Rai Bahadur Dr. A. Mitra of Kashmir, whose widow endowed the Mitra Research Scholarship in diabetes at the Calcutta School of Tropical Medicine, which the author has held during the past seven years. Further, the volume is well published, well bound, and has been published at a price well within the reach of the pocket of the medical practitioner and student in India.

The book consists of 15 chapters and 3 appendices dealing with the whole subject of diabetes as met with in Indian practice. The first chapter deals with the progressive knowledge with regard to diabetes, and includes a very clear and lucid account of the discovery of insulin and subsequent developments. In Chapter II the author defines diabetes as a constitutional disorder due to deficiency in the secretion of the islets of Langerhans in the pancreas,—thus at once excluding such complications as renal glycosuria. Here he fully discusses the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

predisposing causes of diabetes, with special reference to India. Alimentary glycosuria he regards in general as a pre-diabetic state. Blood-sugar curves, given throughout the book for different types of individuals, give it a special value. In India, sums up the author, the causation of diabetes may be traced to "a combination of ill-balanced diet, over-eating, disinclination to any form of active physical exercise, excessive intellectual work, sedentary habits, and too much worry inseparable from the present struggle for existence. The Bengalee Hindus appear to be more prone to get diabetes than the other races living in India." A curious finding by the author is that students for the Diploma of Tropical Medicine at the Calcutta School of Tropical Medicine showed a special tendency to develop glycosuria after their examination, thus illustrating the well-known fact that nervousness and worry may bring on temporary glycosuria.

In Chapter III the general carbohydrate metabolism is fully explained, and here the value of the glucose-tolerance test is brought out in a series of diagrams of great value. Chapter IV considers the inter-relationship of the endocrine glands in sugar metabolism and gives a summary of research work carried out by the author in conjunction with Colonel Acton. The influence of colour in the reaction of rabbits to adrenalin and insulin tests is emphasised. Chapter V deals with the morbid anatomy of diabetes; there are few diseases which leave less obvious changes in the internal viscera. Chapter VI, which is devoted to symptomatology, is brief, but sound. The first symptom to draw attention to a diabetic condition may be ocular, or a persistent pruritus, a carbuncle, or a severe neuralgic pain. Chapter VI deals with diagnosis, and here glycosuria, and especially renal glycosuria, are sharply differentiated from true diabetes mellitus. The time of day when the urine is examined is of great importance, for even true diabetics may give no sugar reaction if fasting. In Chapter VII diets for diabetics are considered, with a general summary of the best well-known diets to-day in vogue; a most useful appendix gives suitable diets for Europeans, Indian patients on a mixed diet, and vegetarian Indians who are suffering from diabetes.

Chapter IX deals with insulin therapy. Here there is presented in brief summary the whole of present-day insulin therapy, its use, its dangers in the tropics, its value, and its limitations. This chapter is admirable in its detailed account of the subject, written especially from the view of medical practice in the tropics. Chapter X considers the complications of diabetes and the diabetic patient in surgery; chapter XI, illustrative cases; chapter XII, glycosuria and life insurance, where most useful advice is given; the patient should be given a drink of glucose when first appearing before the examiner, and his urine tested 1 to 1½ hours afterwards. Chapter XIII deals with observations on the blood chemistry of Indians in normal health and in disease, and summarises a large volume of experimental observations. Chapter XIV details a simplified method for estimation of blood-sugar, suitable for the general practitioner in the tropics, and described by the author in our issue for February 1928. This is eminently practicable, and should obviate the dangerous practice of treating cases of diabetes by observations on the urine alone, unaccompanied by tests for the blood-sugar. Finally, the three appendices deal respectively with the calorific value of different Indian foodstuffs in common use; a classified list of Indian green vegetables according to carbohydrate content; and an account of the life of the late Rai Bahadur Dr. A. Mitra.

We would classify Dr. Bose's book as being eminently practical and essential to the general practitioner. The amount of important clinical information included within its few pages in amazing. It is the outcome of seven years of intensive study devoted to the problem of diabetes as it occurs in Bengal. It is a *vade-mecum* which will prove of great value to the general practitioner in the tropics, whether in Bengal or elsewhere. Finally, we would like to welcome the book as a new addition to the ever growing list of specialist publications issued from the Calcutta School of Tropical Medicine by authors who have devoted several years of work to the specialised study of the subjects concerned. Such professors naturally commence by relying on the published works by other authorities; sooner or later, however, they realise that their own problems are such that nothing less than to deal with them in book form for the benefit of their brother medical practitioners who are faced with the same problems, is adequate.

Dr. Bose's contribution to the subject is in every way satisfactory; it is complete, concise, informative well published, and well illustrated. Finally, its price is very moderate.

FASCIAL GRAFTING IN PRINCIPLE AND PRACTICE.—By H. C. Ossin, O.B.E., F.R.C.S. (Edin.). Edinburgh and London: Oliver and Boyd, 1928. Pp. 92, with 21 plates. Price, 7s. 6d. net.

THE use of the fascia lata in the repair of defects of the soft parts and even of the bones has assumed increasing importance of late years, as the ability of portions of this tissue to survive as free grafts even under apparently unfavourable circumstances has been more widely utilised. In this little work we have an account of the technique of the principal operations in which the fascia lata is utilised, prefaced by some useful introductory matter on its anatomy and histology, which show that it is not a matter of indifference from which portion the graft is taken. The author appears to have interested himself principally in the use of the fascia to prevent recontraction after dissecting out adherent scars and he is to be congratulated on some of the results here illustrated. There is a good account of Gallie and Lemesusice's work and its applications, and Hey Grove's methods are freely quoted in the descriptions of the arthroplastics. The book should be useful to surgeons.

W. L. H.

SYPHILIS—A TREATISE ON ETIOLOGY, PATHOLOGY, SYMPTOMATOLOGY, DIAGNOSIS, PROGNOSIS, PROPHYLAXIS AND TREATMENT.—By Henry H. Hazen, A.M., M.D. Second Edition. St. Louis: C. V. Mosby Co., 1928. Pp. 643, with 165 illustrations including 16 coloured figures. Price, $10.

THE first edition of Dr. Hazen's well-known work on syphilis appeared in 1919, and we congratulate the author that the second edition is no larger despite the fact that many sections have been rewritten. All aspects of the disease are fully considered, and it is impossible in a brief review to do more than refer to a few salient points. After the introductory chapters a section on pathology follows written by Major Matthew Reasoner. Next the clinical aspects are fully described. These are followed by chapters detailing the lesions of special tissues. These include syphilis of the nails and hair, of the mouth and throat, of the respiratory tract, of the digestive tract, of the vascular system, of the bones and joints, of the endocrine glands, and lastly of the central nervous system. The sections on syphilis of the genito-urinary organs, of the eye and of the ear, are contributed by specialists on those subjects. This is followed by a very adequate chapter on congenital syphilis. The chapter on serological tests is from the pen of the well-known authority Dr. Charles F Craig. The final three chapters are devoted to prognosis, prophylaxis and treatment respectively. Under the head of treatment the author states that in his experience the percentage of permanent cures is much higher in those cases in which the Wassermann reaction is positive before treatment, and he adds "it would seem possible that the extremely early treatment of syphilis may on occasion prevent the development of a natural immunity." While this opinion is directly opposed to the experience of others, the suggestion is an extremely interesting one and the last word on this subject has by no means been heard. The description of the malarial treatment of syphilis of the central nervous

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

system is very inadequate, and the reader is left with the impression that the author is undecided as to its value. Under prevention, the difficult question of sexual instruction of the young is touched upon, and the author is in agreement with the view now very widely held that the facts of life should be taught to children through the medium of a course in general biology, commencing with the development of flowers and terminating with that of mammals, rather than by *ad hoc* sexual instruction which is probably undesirable. The coloured plates, the most interesting of which are those showing the cystoscopic appearances of secondary and tertiary lesions of the bladder, are extremely good. The book is beautifully got up and printed on good paper. The illustrations which depict every phase of the disease are of excellent quality. Numerous radiographs are included. The book may be strongly recommended to students and practitioners. Our only criticism is its excessive weight, due presumably to a heavy type of paper being necessitated by such a wealth of illustration.

R. B. L.

THE DUODENUM, MEDICAL, RADIOLOGIC AND SURGICAL STUDIES.—By P. Duval, J. C. Roux and H. Beclese. Translated by E. P. Quain, M.D. St. Louis: The C. V. Mosby Company, 1928. Pp. 212, with 127 illustrations.

EVERY clinician must have come across cases of "dyspepsia" presenting symptoms so indefinite that the most experienced observer is at a loss to decide definitely in which of several closely related organs the cause lies. Cholelithiasis, doudenal ulcers, appendicitis, etc., are usually clearly recognisable, but the class of cases here considered present borderline symptoms and fail to react satisfactorily to medical treatment, nor is surgical intervention likely to be successful unless the operator possesses the experience necessary to interpret the significance of all the abnormal findings in all the doubtful viscera.

It is in this class of case that team-work is so essential, and here we have a monograph by a physician, a surgeon and a radiologist, assisted by a chemist. It does not deal with duodenal ulcer, but with duodenal obstruction caused by inflammatory or congenital conditions, which may be just as disabling as ulcer and nearly as dangerous to life. The subject falls into three divisions, (*a*) periduodenitis due to cholecystitis, (*b*) bands and adhesions of doubtful origin uniting the duodenum to the biliary apparatus or obstructing the third and fourth portions, and (*c*) obstruction of the duodenum by the superior mesenteric artery. An analysis of the pathogenesis and symptomatology of each of these groups is accompanied by a series of radiologic studies and by numerous illustrative case histories. The treatment is always surgical and in the authors' opinion duodeno-jejunostomy is the operation of choice in cases with low obstruction and gastro-enterostomy, combined with separation of adhesions and omental grafting, when the stenosis is higher up. There is a good account of the technique of duodeno-jejunostomy and a discussion of the causation of the severe symptoms of intoxication which appear so rapidly in obstructive lesions of the duodenum. The book is one which we recommend to the perusal of every internist, surgeon and radiologist as giving a lead in the solution of the obscure problems presented by many cases.

W. L. H.

DIAGNOSIS OF CHILDREN'S DISEASES.—By Dr. E. Feer. Translated by Carl Ahrendt Scherer, M.D., F.A.C.P. Second Edition, Revised. London: J. B. Lippincott Company. Pp. xxvi plus 551. Price, 35s. net. Available from Messrs. Butterworth and Co. (India), Ltd. Price, Rs. 26-4.

THE appearance of the second English edition of *The Diagnosis of Children's Diseases* by Professor E. Feer, translated by Dr. C. A. Scherer, after three years shows that it is much sought after. Like its predecessor, it deals with diagnosis only: treatment and pathology are outside its scope. It may seem surprising that over 530 pages should be devoted to this subject exclusively: although some reduplication is inevitable, it is reduced to a minimum. There are 266 excellent illustrations and three beautiful coloured plates. It will form a very useful addition to the library of everyone interested in pediatrics. When eventually the study of diseases of children (which is most essential to every general practitioner) is made compulsory by the General Medical Council instead of one of the useless courses, such as *x*-rays, which is at present compulsory, this volume will be most welcome to every student, if only for its illustrations.

The points to criticise are few. There is no mention of the common occurrence of squint and nystagmus in monologism. Infantile scurvy is said to be "extremely uncommon," and the "black eye" due to it is not mentioned. The use of lipiodol in the diagnosis of bronchiectasis is not referred to: and we think that the use of two vague terms like "croup" and "pseudocroup" without defining what is meant, is very much to be deprecated. We do not agree that the abdomen in intussusception after a short time becomes painful on pressure, or that visible peristalsis is an "important diagnostic sign." The common occurrence of a palpable tumour in congenital stenosis of the pylorus is not described.

The acute and chronic nutritional disturbances of infants are fully dealt with: the classification of Finkelstein as well as that of Czerny and Keller is well described. The book is fully indexed: it is beautifully printed and well bound. The publishers, Messrs. J. P. Lippincott & Co., are to be congratulated: Messrs. Butterworth & Co., Calcutta, are the agents in India.

S. A. M'S.

NUTRITION.—By Walter H. Eddy, Ph.D. London: Baillière, Tindall and Cox, 1928. Pp. vii plus 237, with 37 tables. Price, 11s. 6d. net.

IN the first part of this book the author has attempted the very difficult task of writing a general account of the science of nutrition for non-scientific readers. To do this logically would require either a considerable preliminary treatise on elementary chemistry and physics, or a presumption of some small and definite amount of knowledge of these subjects. The author has not consistently followed either of these alternative plans. In places, (e.g., in the description of the essential similarity of burning fuel in a furnace and food in the body) no previous knowledge has been presumed. In many other places (e.g., on the respiratory quotient) a fairly considerable knowledge of chemistry is necessary to follow the argument. The result is that to a strictly non-scientific reader the book will be unintelligible, while to one already acquainted with the elements of nutrition this part of the book will be superfluous.

The second part of the book deals at length with the vitamins, and the methods of testing the vitamin content of food-stuffs, etc. Here the author is on the part of the subject to which he has obviously given special attention, and consequently here he puts the matter clearly and intelligibly. *Ce que l'on conçoit bien s'annonce clairement.* It is an account which can be read with interest both by intelligent laymen and by scientists who have not made the vitamins their special study.

C. N.

REQUISITES AND METHODS IN SURGERY.—By Charles W. N. Cathcart, C.B.E., M.A., M.B., C.M. (Edin.), F.R.C.S. (Eng. & Edin.) and J. N. Jackson Hartley, O.B.E., M.B. (Edin.), F.R.C.S. (Eng. & Edin.). Edinburgh: Oliver and Boyd, 1928. Pp. 476, with 246 illustrations. Price, 12s. 6d. net.

THIS is an excellent little book on minor surgery. The method of dealing with the subject is new, clear and lucid. The chapters on "Medico-Legal Notes,"

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ACRIFLAVINE

"B.D." BRAND

By reason of its powerful antiseptic action and its freedom from toxicity and caustic effects of any kind, Acriflavine "B.D." brand has a wide sphere of usefulness in general practice.

Issued also in tablet form in concentrated solution and in 1 in 1,000 solution ready for use either as a lotion or for injection

For example, in the antiseptic treatment of wounds of every description its great antiseptic power and healing action have proved to be of exceptional value, whilst it is now generally recognised as being more suitable than any other antiseptic in the irrigation treatment of gonorrhœa.

Euflavine and Proflavine—the former being more suitable for intravenous injection than Acriflavine—also are issued under the "B.D." brand.

Clinical reports and details of different forms of presentation sent on request to :

HENRY S. CLARK,
8-10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Buildings,
Parsee Bazar Street,
FORT, BOMBAY, No. 1.

THE BRITISH DRUG HOUSES LTD
LONDON

F' An/295

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"NORMACOL" BRAND.
TRADE MARK

Intestinal Evacuant.

"Sweeps the bowel clean"

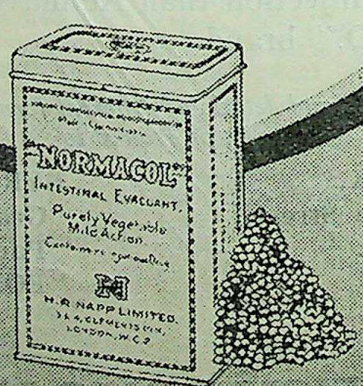
PAINLESS. HARMLESS.
MECHANICAL IN ACTION.
NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

A PURE VEGETABLE PRODUCT.
Containing NO Agar-Agar,
Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H.R.NAPP LIMITED.
3 & 4, Clements Inn, London, W.C.2.
Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two Lines)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"Post-Mortem Examination" and "Hospital Economy" are valuable additions to a hand-book on minor surgery such as this. The book is illustrated by copious helpful diagrams. It will be found a most useful book, not only by students of medicine but also by doctors in general practice.

P. B.

CLINICAL SURGERY.—By J. W. Dowden, M.B., F.R.C.S.E. Edinburgh: Oliver and Boyd, 1928. Pp. 68. Price, 2s. net.

THIS little pamphlet is meant as an introduction to clinical surgery for junior students and is quite original in its scope. It is an effort to teach students how to examine and treat a case. The author rightly emphasises the importance, which is most often forgotten by students, of utilizing their senses in the examination of cases in an orderly and rational way. Not only is emphasis laid on this point but also on the value of facts as opposed to theories. It is meant to teach students to be systematic in their methods of study and how to use to best advantage their personal gifts and powers of observation in the diagnosis and treatment of surgical cases. This book will be found invaluable by students of medicine.

P. B.

OPERATIVE SURGERY.—By J. Shelton Horsley, M.D., F.A.C.S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. Third Edition. St. Louis: The C. V. Mosby Company, 1928. Royal 8vo. Pp. 893, with 756 illustrations. Price, $15.00.

TEXTBOOKS of operative surgery may usually be placed in one of two classes. The first consists of a description of the standard operations of surgery, including many obsolete operations and omitting many of the most recent. The second records the author's own practice, and his comments on the present-day procedure of other surgeons. It is essentially to the second class that this volume belongs and its appeal therefore is to the surgeon rather than to the examination candidate.

The opening chapter is an abstract of the author's paper on "The Value of Biologic Principles in Surgical Practice", and contains much thoughtful criticism of operations which had and still have a vogue.

The chapter on surgical drainage sets out the principles which should be the guide for every surgeon, but which are too frequently ignored.

When we come to the chapter on surgical technic, the description is somewhat sketchy and it should rarely be necessary to control hæmorrhage in an abdominal incision by whipping over the muscle as depicted in Fig. 26.

A chapter is devoted to transfusion of blood and all the standard methods are described. The author has also done a large amount of experimental work on the suturing and anastomosis of blood-vessels and gives us the benefit of this work in an interesting chapter; periarterial sympathectomy is briefly described, though obviously the author is not enthusiastic over the results. We are surprised to note that incipient gangrene is not included as an indication for the operation. It is these cases that certainly furnish the most striking results the reviewer has seen. The author advocates ligature of the femoral vein in cases of impending gangrene of the leg, but we see no reason why this should not be combined with periarterial sympathectomy. The ligature of the main arteries is carefully described, but a notable omission in the reviewer's opinion is the description of Quervain's technique for the inferior thyroid.

In dealing with aneurisms requiring ligature of the common carotid, various methods are suggested for avoiding cerebral symptoms, such as the temporary application of a Crile's clamp or partial occlusion by a metal band. The methods of dealing with arterio-venous aneurisms are described, though we are glad to see that the difficulties are not minimised even by an author who has a wide experience of experimental work on arterial suture.

Plastic surgery is very fully dealt with and includes operations which are not usually found in British textbooks such as those for face lifting, removal of wrinkles, double chin, etc. The omission of any reference to the Addison relaxation incision in operations for cleft palate should be rectified.

The remainder of the volume is made up of chapters on regional surgery, and all are very complete and include a number of operations that may still be regarded as on trial, as well as those more generally recognised. Although several operations are described for hernia, Gallic's operation has not been included, an omission which will surely be rectified in subsequent editions.

In gastric surgery a great deal of space and discussion is devoted to the author's operation for pyloroplasty. This is an operation which is performed much more frequently than present-day surgical literature would lead one to suspect. Some of our most advanced surgeons are firm advocates of it and it is encouraging to find it has equally firm advocates on the other side of the Atlantic. When gastrectomy is called for the author uses his own modification of Billroth I, wherever possible. The modification he advocates would seem to simplify the operation and make it safer. The chapter on stomach operations is very complete and includes a note on the physiology of the stomach which surgeons are apt to overlook in their enthusiasm for new procedures. Notable omissions in the chapter on abdominal incisions are the Battle incision, though it is admittedly falling into disuse, and the Kocher incision for gall-bladder operations.

The volume concludes with chapters on genito-urinary operations, all of which are fully discussed with their accidents and complications such as division of the ureter. Gynæcological operations are omitted.

The book is well printed and the illustrations numerous and excellent. It is written in a style that is eminently readable and nearly every page has some point of interest that repays perusal. The author describes the operations in a free running style quite distinct from the usual textbook division of an operation into so many steps. It is not only a book to which a surgeon may turn for details of an operation, but one which he can pick up and read with pleasure and profit in his moments of leisure, if he has any.

A. H. P.

MATERNITY AND CHILD-WELFARE.—By A. P. Pillay, O.B.E., M.B., B.S. and M. Subramanyam, M.B., B.S., B.Hy., D.P.H., D.T.M. & H. Sholapur: The Maternity and Infant Welfare Association, 1928. Pp. vii puls 94, with Appendices and Index. Price, Rs. 3.

"THE first axiom of infant-welfare work is often misunderstood, that *its object is not so much to save infant life as to secure health to infants that survive.*"

These very significant words of Dr. Balfour quoted on page 10 of Dr. Pillay's maternity and child-welfare deserve the very closest attention of every reader of this useful little book; for the greatest obstacle to the maternal and child-welfare movement in India is not so much the ignorance of the illiterate masses as lack of interest and apathy on the part of the educated classes, both Indian and European. Too often people take the view that successful child-welfare work can only intensify the evils of over-population; and because of this mistaken notion they either deliberately oppose it or give it only lukewarm support.

This book is not intended merely for doctors and nurses; but all who can understand English should read it, so as to get a clear understanding of what is meant by maternal and child-welfare work and what can be done in this direction both in towns and rural areas in India, even with very limited resources. This is all the more necessary because, as Dr. Pillay points

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

out in his preface, "Even our medical men and women and social workers are surprisingly ignorant of what maternity and child-welfare work is."

Dr. M. I. Balfour contributes the opening chapter on the history of maternity and child-welfare work in India and traces the beginnings of the movement back to the sixties of the last century. But apart from the work of this nature organised in Bombay by Lady Willingdon and Lady Lloyd little of permanent value was accomplished, until in quite recent times the All-India League for Maternity and Child-Welfare was established by Lady Chelmsford and the All-India Baby Week was inaugurated by Lady Reading.

Chapter II explains the need for maternity and child-welfare work in India and naturally lays very great stress upon the very high rates of mortality. Nevertheless attention is called to the fact that "A high infant mortality not only implies the loss of many infants but also:—

(*a*) the maiming of many surviving children, for conditions which kill some, only injure others;

(*b*) a high death-rate in the next four years of child life; and

(*c*) the existence of unhealthy conditions in the mothers and in the home life of the people."

Chapter III is devoted to a description of welfare organisations and explains "how to make a start with work of this kind."

Chapter IV describes simple forms of welfare work and is especially useful and stimulating, as the following paragraph will show:—

"The simplest and cheapest form of work and one that could be adopted even in the larger villages is for a few ladies to form themselves into a committee, get on loan or hire a room in some convenient locality and hold, once or twice a week, informal talks to the women in the neighbourhood, teach them the preparation of baby feeds, sewing, and occasionally get doctors and others to give lectures and if possible magic lantern demonstrations on the care of the mother and the baby."

"The ladies may not know much at the beginning but they are sure to pick up in time."

Chapter V discusses the health visitor and points out that she is always the central figure in maternity and child-welfare campaigns. Courses of training for health visitors are also described, but it is not quite clear why the author should speak of a vernacular course "as a necessary evil." Chapter VI deals with the question of help required by women during confinement, in the form both of maternity homes, etc., and the training of midwives and *dais*.

In Chapter VII and VIII Miss R. Piggott and Dr. DaGama give their experiences in the training of *dais*. Over 350 *dais* have been trained in Sind and over 200 in the Poona district.

Chapter IX is devoted to ante-natal clinics and welfare centres. Any town or village which has a visiting midwife or health visitor can start a "centre" says Dr. Pillay. "A small room will be sufficient in the beginning." Apart from the special welfare work of the centre, including the keeping of records and the weighing of children, various other side activities are suggested, such for example as classes on mother craft, infant and invalid cooking, cutting out and sewing clothes, domestic hygiene and home nursing, health and welfare talks and lectures by doctors and other qualified persons; magic lantern and cinema demonstrations and feeding of children and expectant mothers. The author takes care to point out, however, that if any of these activities are undertaken special accommodation or a large hall will be necessary.

In Chapters X and XI Dr. Tilak deals with propaganda work and points out the value of the fullest possible co-operation between all official and non-official agencies. "Nearly a million and a half men and women in about 4,000 places," says Dr. Tilak, attended the lectures or shows organised by the Madras Health Council in co-operation with the Department of Public Health during 1926, largely owing to the great interest taken in this form of propaganda by the Collectors of the Madras Presidency.

Chapter XII describes day nurseries and homes for children. "In India the poverty and bad housing conditions make the opening of crèches in the poorer localities of towns a great necessity." There would seem to be a special need for such institutions in industrial areas, etc., and managers of mills, tea gardens, etc., employing female labour may find useful hints regarding the organisation of day nurseries in this chapter.

Chapter XIII refers to welfare work among children of pre-school age, including nursery schools, etc.

In Chapter XIV welfare work in rural areas is taken up and the suggestion is made that "the question of improving confinement rooms can be most easily tackled and the opening of small though rudimentary maternity homes is also not beyond practical politics."

The next chapter deals with record keeping and then come two more on how Government and local authorities can help formal maternal and child-welfare. Several final chapters are then devoted to a description of work in England, together with a summary of the legislative enactments in force in Great Britain in regard to child and maternal welfare.

A further valuable feature of the book is a series of 12 appendices in which are given detailed suggestions regarding practical maternal and child-welfare work. The book may be strongly recommended as a most useful manual for everyone whether medical or lay, European or Indian, who can be induced to take a practical interest in maternal and child-welfare.

C. A. B.

PHYSIOLOGY AND BIOCHEMISTRY OF BACTERIA. VOL. I.—By R. E. Buchanan. Ph.D. and E. I. Fulmer, Ph.D. London: Baillière. Tindall & Cox, 1928. Pp. xi plus 516, figures in the text 78. Price, 34s. net.

WE hope that this is the commencement of a valuable series of books on the *Physiology and Biochemistry of Bacteria*. The work, although a compilation, gives the essential points that are required by advanced students in the study of these primitive forms of plants. The book makes one realise the great necessity of having a good knowledge of mathematics, physics and chemistry before undertaking a study of the physiology and biochemistry of the bacteria. The ordinary reader will not find much benefit from the book unless he possesses this knowledge.

We can, however, recommend the book thoroughly for advanced workers in research laboratories, as it contains a good deal of information that would otherwise have to be searched for in the literature; for example, the whole subject of agglutination, although dealt with briefly and systematically, gives a good general survey of the work on the subject, which is necessary before undertaking any research on it.

We congratulate the authors on the production of this most valuable work, and look forward to the additional volumes that are to complete the series.

H. W. A.

A TEXTBOOK OF PATHOLOGY.—By W. G. MacCallum. Fourth Edition. Thoroughly revised. London and Philadelphia: W. B. Saunders Company, Ltd., 1928. Pp. 1177, fully illustrated. Price, 45s. net.

DR. MACCALLUM'S *Textbook of Pathology*, first produced in 1916, has now reached its fourth edition. Various alterations in structure and arrangement have been made, but these it is not our purpose to record—at least in detail. What impressed us most in a survey of this new edition of the book is the change which appears to have taken place in the author himself. In none of his writings does Dr. MacCallum ever

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Oral Sepsis
and
Intestinal Toxaemia

The term Oral Sepsis was introduced by Dr. William Hunter in 1900 and sponsored by Sir Thomas Barlow in his recognition of it as the greatest septic infection in medicine. As the years passed a growing circle of believers joined in appreciation of Dr. Hunter's work and nomenclature, and in 1910 Dr. Mitchell Bruce in his presidential address said:

> "Its effects are so widespread, so multiple, and frequently so grave as to make us ashamed of our previous blindness to a common source of blood infection staring us in the face all these years."

In view of the world-wide interest now taken in oral sepsis, the following extract from a letter, recently received by the proprietors of Dimol from a distinguished Fellow of The Royal College of Surgeons, should make a strong appeal to all Medical and Dental Practitioners.

> "I have been using Dimol (tablets) and there is no doubt whatever that it is the very thing I have been trying many years to obtain, in order to settle a point which I have been considering for a long time.
>
> "I believe it is generally assumed that the organisms which are responsible for Dental Caries and Pyorrhœa find their way to the intestine, and there set up putrefaction and fermentation, which cause the common symptoms of mal-digestion, and subsequent toxæmia (lassitude, headache, etc.). There seems to me another possible theory, viz., that Pyorrhœa is a *blood infection*, and that this infection may be directly attributable to a bacterial disturbance in the intestinal tract. I am inclined to this view because during a long career I have come across so many young people suffering from the intestinal symptoms first, and *then* getting Caries and Pyorrhœa.
>
> "I am personally most grateful for Dimol."
>
> ———, F.R.C.S. (Eng.).

The efficiency of Dimol in the treatment of putrefactive and other bacterial invasions of the intestinal tract is conclusively told in the interesting clinical reports which, together with a brochure dealing with the pathological significance of the intestinal toxæmias, will be sent to any medical or dental practitioner on request.

Dimol Laboratories, Ltd., 40, Ludgate Hill, London, E.C.4.

Dimol may now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

***Vide* Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.**

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

show any evidence of bigotry or didacticism, but he now seems to have reached a plane of what one might almost call gentle pessimism. As an example, take the opening sentence of the last paragraph of that section of the book devoted to nephritis. "We are left as we began, with only momentary ideas as to the cause of nephritis....." this, be it noted, following on an exposition of the subject which can only be described as "masterly"—a much abused word, strictly applicable in this instance.

In the revision of a book of this size, it is almost inevitable that some portions should have been less carefully overhauled than others. The section on yellow fever, for example, is brief but fully up to date, including even the recent work of the late Adrian Stokes: the bibliography on the pathology of leprosy, however, contains no references later than 1914. The important work of Schobl on monkeys might usefully have been included in the yaws section: the pathology of kala-azar is dismissed in a few lines and the statement is definitely made that "the disease.....is transmitted by the bite of a fly, *Phlebotomus argentipes*." Chapter 52, p. 935, begins thus "The recent discussion of chronic affections of the joints at the International Congress of Medicine in London....." but on referring to the end of the chapter we find that the congress in question was held in 1913.

We hope that Dr. MacCallum will excuse this somewhat carping criticism: we feel that it is perhaps a little unfair in that the author does not make any pretence to cover the vast field of *tropical* pathology. To sum up, MacCallum's *Textbook of Pathology* has still further enhanced its reputation as a comprehensive and scholarly exposition of the science of pathology: in this field it has few compeers in the English language.

For their part in the production of this handsome volume the publishers fully merit the thanks expressed by the author in his preface.

J. M. H.

EXERCITATIO ANATOMICA DE MOTU CORDIS ET SANGUINIS IN ANIMALIBUS (AN ANATOMICAL STUDY OF THE MOVEMENT OF HEART AND BLOOD IN ANIMALS).—By W. Harvey, M.D. With an English Translation and Annotations by C. D. Leake. London: Baillière, Tindall and Cox, 1928. Pp. xii plus 228, with 5 plates. Price, 16s. net.

It was not to be expected that the tercentenary year of the publication of Harvey's "De Motu Cordis" would be allowed to pass without the appearance of new editions of this famous work. Furthermore, it is not surprising that at least one of these editions should be issued by a firm famous for their medical publications. Messrs. Baillière, Tindall and Cox have gone one better than publishing a new edition; they have published a new translation.

The volume is very complete; it contains a facsimile, not of the title or one or two sample pages only, but of the whole of the original 1628 edition. This is followed by the new translation, a translator's note, a chronology of the life of William Harvey and an index. There are also a number of plates. Amongst these are included reproductions of the most famous portraits of Harvey and of the original plate "Experiments on a bandaged arm."

In these days few members of the medical profession are able to read Latin with ease, but the majority of us can struggle through a Latin passage when we are interested enough to desire to know its full meaning. For this reason, in conjunction with the fact that the translation is a very free one, the reproduction of the Latin text is particularly welcome. There is, however, something very unsatisfactory about a facsimile reproduced by modern methods; the letters are never very clear cut and one finds oneself absentmindedly cleaning one's glasses at very frequent intervals. The reproduction in this case is quite up to the average.

This is the third English translation to appear; there was a contemporary translation (1653), and in 1847 the Sydenham Society published Dr. Willis's translation. Dr. Chauncey D. Leake, though a professor of pharmacology in an American University, has produced a translation in very excellent English, with only a few of the less offensive American spellings, such as "fetus." There was plenty of excuse for a new translation; Dr. Willis's translation appears to have pleased few people, whilst the earlier translation appears to have displeased Dr. Willis. The reviewer is more fortunate than was Dr. Leake in that he possesses a reprint of the 1653 translation. The subsequent reading of the present translation gave him exactly the same type of shock as he imagines that he would receive when first seeing a Shakespeare play in modern dress. There is something improper in the appearance in modern English of some of Harvey's apparent naiveties, his putting forward as new ideas facts which not only every first year medical student but every elementary school child now knows. But when these are decently clothed in the English of Harvey's time all the impropriety is lost.

During the making of this translation there must have been many moments when the translator felt very uncertain of the line he should take; on at least one occasion, in our opinion, he made a wrong decision. "Vena arteriosa" and "arteria venosa" have been translated, almost throughout, as "pulmonary artery" and "pulmonary vein," respectively. One can see the translator's difficulty. "Arterial vein" of the 1653 translation did not please him, rightly; on the other hand, being a translator, one supposes that he felt he must translate. All went fairly well until the last chapter was reached. Then he found that if he continued to translate "vena arteriosa" as "pulmonary artery," this chapter would read as sheer nonsense: (in this chapter Harvey points out that the *vena arteriosa* is really an artery and the *arteria venosa* really a vein). He therefore adopted the procedure—which, in our opinion, he should have adopted throughout—of giving the original Latin in italics. The translator's irritation is reflected in his last footnote; he turns on the unfortunate Harvey and says "Since he so clearly points out the inconsistences of the current names, why did not Harvey rename the vessels? One may sometimes be too deferential to traditional authority." Surely this criticism is grossly unfair. Dr. Leake, a pharmacologist, is perhaps not as troubled by kaleidoscopic nomenclature as are his protozoological and entomological colleagues or, we feel, he would not have suggested this. In his day Harvey was doubtless considered a hot-headed young revolutionary by many of his colleagues, but had he tried altering traditional names he would certainly have been considered a lunatic and treated as such. He put forward arguments as to why the names at that time in use were unsuitable. When his opinions were universally accepted then would be the time to effect the alteration.

The printing, paper and binding are excellent. A copy of this book should form part of the library of every medical institution and of every doctor who takes any interest at all in the history of the science he has adopted.

L. E. N.

MODERN MEDICINE.—Edited by Sir William Osler, Bart., M.D., F.R.S. Third edition, thoroughly revised and re-edited by Thomas McCrae, M.D. Assisted by Elmer H. Funk, M.D. General Index. London: Henry Kimpton. 1928. Pp. 126. Sold in sets only. Six volumes and index £12 12s. net.

With the publication of this volume, Osler's world-famous system of medicine is complete. This, the third edition, was planned during Sir William Osler's lifetime, but he died more than a year before the first volume appeared; the work of editing this edition of "Modern Medicine" has been very ably carried out by Dr. Thomas McCrae. The six volumes and the index have appeared within a period of about three years and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

there was an interval of twelve years between the second and third editions, so that the prospective purchaser need have no fear that his edition will become a back number shortly after he has bought it.

As an index the volume under review is all that an index should be, the type is clear and well spaced, the paper is of good quality and easy to turn, and the binding is strong and in keeping with the other six volumes of the edition.

L. E. N.

CHOLERA AND ITS TREATMENT.—By Ramkrishna Guin, L.M.F., Bengal Medical Service. Calcutta: The Book Co., Ltd. 1929. Pp. 76, with 5 Illustrations. Price, .

THIS is a useful and practical little manual. The author was house physician and resident medical officer, infectious diseases wards, Campbell Hospital, Calcutta, and served under that veteran teacher Rai Dr. Lal Behari Ganguli Bahadur, who has been in charge of the cholera wards at the Campbell Hospital for very many years, whose practical experience in the treatment of the disease is probably unrivalled, and to whom the book is dedicated. As a result the book is essentially a practical one, written from personal experience and therefore of value.

The bacteriology of the cholera vibrio is very scantily dealt with, but the sections devoted to diagnosis, differential diagnosis, and above all, treatment, are very sound and well written. The author regards the essential oils' mixture as of prophylactic rather than therapeutic value, and adheres to hypertonic and other saline infusions as the sheet-anchor of treatment for severe cases. He is of opinion that repeated small fractional doses of calomel have a definite value in the treatment of cases seen at an early stage, and his notes on the indications for atropine are interesting. Formulæ for stimulant and alkaline mixtures are also given.

This little book should prove useful to medical practitioners throughout India. It is well printed, well bound, and well illustrated. It is marred, however, by numerous printer's errors, which we should like to see corrected in a second edition.

R. K.

MEDICAL AND ALLIED TOPICS IN LATIN POETRY.—By Heinrich Oppenheimer, D.Lit., LL.D., Ph.D., M.D., M.R.C.P., Barrister-at-Law. London: John Bale, Sons & Danielsson, Ltd. 1928. Pp. vii plus 445. Price, 30s. net.

ONE'S sympathy goes out at once to the author of this delightful volume, who states in the preface that during the War he was regarded as an enemy alien, and, having been subjected to social ostracism, sought comfort in the company of the classical writers. Further, one learns from his preface that having been struck down with a serious illness, he believes that this work is of the nature of a valedictory gift to his medical confrères. Truly we hope that this will not be the case, for the book was very well worthy of publication; it is erudite, delightful, pleasing; it may have but few readers, but those who browse in its pages will enjoy it to the full.

Luckily for its readers, the author has appended throughout English translations to the Latin passages quoted. However much we may have enjoyed (or not) ploughing through the *Æneid* in our schoolboy days, there are unhappily but few of us who in our maturer years can translate a Latin passage at sight. And the translations are extremely well chosen; some are the author's own; the majority however are from well known and universally accepted English metric translations. Dryden, Rowe, King, Dove's *English Classics*, Cranstoun, and other well-known translators have all been resorted to. (And in this connection the reviewer may recall a most apposite remark made by one of the most distinguished men in the field of scientific research of to-day to the effect that one of the world's greatest losses was the abandoning of Latin as the universal language of Science and Medicine. This we believe to be true. Had we adhered to Latin as the second language for every scientific student, and were all scientific and research papers to-day published in Latin, we should at once have had a universal scientific language in which *all* journals and textbooks would be published, and every discovery published would immediately be accessible to all workers on the subject. There would be no need for translations, and the freest intercourse on scientific matters would be possible between all nations.)

The book covers a very wide field: physicians, divine and heroic; medical sociology; physiology; surgery; diseases of the eye; of the nose, throat and ear; infectious diseases; internal disorders; materia medica; dietetics; balneology—in which the ancients excelled; toxicology; alcoholism; neurology; sexology—if we may be permitted to quote that malphonious term; midwifery; dermatology; cosmetics; nursing; and medical metaphors are among the many and most diverse subjects to which chapters are devoted. A good index completes the volume.

One cannot "review" this book; one can only "browse" through its pages—a course which the author himself recommends. The author hopes that "here and there some congenial soul may derive as much pleasure from devoting an hour of leisure after a hard day's work to turning over its pages as the writer has found in compiling it." This hope is fully justified; there is a wealth of literary and educational material in its pages. For example, who would forego the true and inner history of Aesculapius' serpent, or the chapter on medical sociology, the relations of doctor and patient in the ancient days, the medical education in the Roman Empire that was? The snake it was, according to ancient beliefs, whose breath resuscitated the dead to life—or possibly the healing herb which it brought in its mouth.

Under the later Empire physicians apparently came to be of little repute, and Juvenal in his *Satires* comments on their failings with a caustic pen. Even Ovid sometimes descends to the sarcastic vein:—

"He that by the physician has been left
Yet of all hope is not bereft."

One of the most interesting features of the book is its frequent reference to quartan ague as a rather fatal disease. Quartan malaria to-day is rather apt to be a mild but persistent infection; one wonders whether the virulence of this disease has changed within the last two thousand years.

We have no space in which to comment further upon this most charming volume, though we wonder whether Cleopatra really suffered from syphilis, as suggested on p. 343.

Emphatically a book for leisure hours, and a book for the *littérateur*. But

"When we know not how our ills arise,
Nor whence they come, our way in darkness lies,"

a quotation which may be applied to much of even modern present-day scientific medicine.

We hope that Dr. Oppenheimer's estimate of the success of his own book may be a mistaken one; there is here many an apposite quotation, and many a page and chapter full of information—ancient, perhaps, but very applicable to modern times.

R. K.

A PATIENT'S MANUAL OF DIABETES.—By H. W. Moxon, B.A., M.R.C.S. (Eng.), L.R.C.P. (Lond.). London: H. K. Lewis and Co., Ltd. 1929. Pp. xii plus 132. Price, 6s. net.

THE keynote of success in the treatment of diabetes depends to a large extent on the intelligent co-operation of the patient, and for this an intelligent understanding of the nature of the malady is a great help to him. It is encouraging to find that some authors are devoting their attention in this direction and Dr. Moxon's book is a useful addition to the list of books published on the subject. The book has been written solely from the patient's point of view.

In Chapter III the author has taken a good deal of trouble in trying to give a clear idea of the metabolism in diabetes by comparing the human body with a motor car engine. He has first of all compared the human body in health with a perfectly working engine, in order

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Solution of Urotropin, sodium salicylate and caffeinesodium salicylate

Indications: Obstinate cases of cystitis, pyelitis, pyelonephritis and prostatitis. Effective prophylactic against cystitis after prostatectomy and internal operations during pregnancy and delivery. Infectious diseases (typhus abdominalis, poliomyelitis, meningitis, encephalitis, angina, otitis media). A remedy almost unfailing against post-operative retention of urine. Valuable agent in the treatment of diseases of the liver and biliary tracts, of posterior gonorrhoeal urethritis in acute and chronic cases. Persistent vomiting of pregnancy.

Original packings: For intravenous injection Boxes containing 5 ampoules, each of 5 cc.
For intramuscular injection „ „ 5 „ „ „ 5 „

Medical men are invited to apply for literature and samples to:

SCHERING-KAHLBAUM (INDIA), LTD.

Telephone: Cal. 4770
Telegrams: Aeskulap

CALCUTTA

4, Dalhousie Square,
P. O. Box No 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings; P. O. Box No. 164.

F. SCHWERZMANN & CO., Rangoon (Burmah): 26. Merchant Street.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Allonal "Roche"

The modern remedy for insomnia and pain. Quick in action. Suitable for young and old. Not subject to D. D. A.

Digalen "Roche"

A really dependable Digitalis preparation, constant in composition, well tolerated. Given orally, intramuscularly, intravenously.

Sirolin "Roche"

An improved Thiocol syrup containing but one drug: Thiocol "Roche", the well-known, safe remedy for affections of the respiratory system.

The above preparations are available in the following packings:

Allonal "Roche": Tablets in bottles of 12 and 100

Digalen "Roche": Solution in bottles of 15 c.c.

Tablets (oral) in phials of 25

" (hypod.) in tubes of 12

Ampoules in boxes of 6 and 12

Sirolin "Roche": In 6 ounce "Roche" bottles only.

F. Hoffmann-La Roche & Co., Ltd.,

Basle, Switzerland.

Agents for India and Ceylon:

VOLKART BROTHERS

P. O. Box 606, Calcutta
P. O. Box 22, Karachi

P. O. Box 199, Bombay
P. O. Box 45, Madras

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to make non-medical men understand exactly what goes wrong in diabetes. He has compared the carbohydrates, fats and proteins (to some extent) in the diet with the petrol in the motor car engine. Regarding the inherent property of the human system for the repair of the daily wear and tear of the tissues through the protein foods, there can be no comparison with the motor car engine because there is no mechanism there to repair the wear and tear due to use.

In this way the author has explained how combustion of the food takes place in the human body and how we get the calories that we require from the food we eat.

In Chapter IV the author has described how the human engine works in diabetes. For the smooth working of the motor car engine, there must be (1) a proper mixture of gasoline and air and (2) the ignition must be proper, because unless the sparking plugs are in working order to give a good electric spark it cannot ignite the mixture of gasoline and air. This function, in the author's opinion, goes wrong in diabetes. The spark or ignition has been compared to *insulin* and it is due to the loss or deficiency of this substance in the diabetic subjects that the proper combustion of carbohydrate food cannot take place.

The treatment of diabetes is described in simple language in Chapter VII, and in Chapter VIII the author describes how meals should be arranged for diabetic patients. The patient gets a fixed amount of carbohydrate, protein and fat for the day and he must choose a suitable diet and divide it into 2 or 3 meals and remain contented with that. The homely example which the author has given, such as a husband fixing a certain amount of money for his wife's dress and telling her that she can get whatever she wants so long as she keeps within the amount fixed for her, though quite appropriate, is not always practical. We are afraid that the average wife always tends to get round the husband and obtain whatever she wants even though "the husband absolutely fixes £15 for her hat, dress, and coat." We do not want the average diabetic patient to follow the wife's example and coax the doctor to give more than the doctor has actually prescribed for him.

Chapter X describes the general care of diabetic patients and Chapter XI describes insulin treatment. The last chapter describes the ordinary useful urinary tests which the patient can carry out himself.

The appendices are useful. No. 1 gives food value tables and No. 2 gives some very useful recipes for patients on a diabetic diet.

We feel sure that the book will be found useful by persons suffering from diabetes, because its perusal will enable them to follow their doctor's advice more intelligently and secure its fullest benefit.

J. P. B.

AN INDEX OF SYMPTOMATOLOGY.—By various writers. Edited by H. L. Tidy, M.A., M.D. (Oxon.), F.R.C.P. (Lond.). Bristol: John Wright & Sons, Ltd. 1928. Pp. 710 with 130 illustrations, some in colour. Price, £2 2s. net.

THIS volume forms an excellent companion to the *Index of Treatment*, the 9th edition of which was recently issued by the same firm of publishers. The former should be as popular as the latter has been; somehow one fears that it will not be. Symptomatology does not lend itself to indexing so well as does treatment. It cannot be said that diagnosis is actually more important than treatment; they are so completely interdependent—without the prospect of treatment a correct diagnosis would be pointless, and without diagnosis correct treatment would be impossible—but it is safe to say that diagnosis is more difficult than treatment, and that, therefore, the more we read on the subject the better.

The subjects dealt with in this volume cover a wide range; medicine, including tropical medicine, surgery—including special subjects—and gynæcology. There are about twenty-five contributors, some of whom deal with one or two, and others with many subjects. In most cases the writers are experts on their particular subject and are writing from wide practical experience in the several diseases with which they deal. The various tropical diseases, which are naturally scattered throughout the book, are dealt with by one writer who is acknowledged as one of the leading experts on tropical medicine. This contributor has written on twenty-five different subjects. As it seems unlikely that any one man will have had much personal experience on more than about half these subjects, it seems that it would be better to have employed three or four contributors from different tropical areas to write on these very diverse subjects.

The volume should form an extremely valuable addition to any student's or medical man's library. The general arrangement of the book is very satisfactory, the printing and paper are excellent and the binding appears to be strong.

L. E. N.

NUTRITION IN HEALTH AND DISEASE FOR NURSES.—By Lenna F. Cooper, B.S., M.A., M.H.E., Edith M. Barber, B.S., M.S., and Helen S. Mitchell, B.A., Ph.D. London: J. B. Lippincott Company. 1928. Pp. viii plus 574 with 102 Illustrations. Price, 12s. 6d. net. Available from Messrs. Butterworth and Company (India), Ltd. Price, Rs. 9-6.

THIS is one of Lippincott's Nursing Manuals, to which the description of "complete, practical, standard" is given by the publishers. Though intended primarily for nurses, the book is really a very complete exposition of the science and art of nutrition and cooking. The chapters on the principles of nutrition are scientifically sound and commendably brief. The physiological aspects of nutrition and food-stuffs are clearly and interestingly expounded. Cooking, the sense of food, the making of hospital menus and dietaries, and the modifications of diets required in various diseases are described. Numerous recipes for all sorts of meals are given, and though some of these are peculiarly American, the majority could be made equally well in India. The illustrations in this part are good and appetising. There is a useful chapter on teaching and examination methods.

This book deserves a wide circulation amongst hospitals and nursing institutions, though of course the section on cookery refers only to European dishes. Like most American publications, the book is very well got up, the printing and illustrations being of a high standard.

A. D. S.

FOOD.—By Robert McCarrison, C.I.E., M.D., D.Sc., LL.D., F.R.C.P., Lieut.-Col., I.M.S., Director of Nutritional Research, Pasteur Institute, Coonoor, South India. Madras: Macmillan and Co., Ltd. 1928. Pp. vi plus 115. Price, As. 12.

COLONEL MCCARRISON'S work on nutrition is so well known that anything from his pen is assured of a ready welcome. The present book is a small publication intended for the masses of India in particular. It sets forth the main facts about nutrition in a clear and succinct manner, explaining the uses of food, the purpose and nature of the proximate principles, minerals and vitamins, and the sources of these amongst Indian foods. The nature and necessity of "balanced" diet is discussed and the faults of ordinary Indian, Anglo-Indian and European diets in India discussed, and means of rectification suggested. A useful table of the composition of Indian food-stuffs is given. The diagram of the "Food Star" is effective and striking. The book is dedicated to the "Children of India," the price extremely moderate (12 annas), and the proceeds of its sale are to be devoted to certain Indian charities.

We recommend the book strongly to all teachers, colleges, welfare centres and juvenile organisations.

A. D. S.

MALAY POISONS AND CHARM CURES.—By John D. Gimlette, M.R.C.S., L.R.C.P. Third Edition. London: J. A. Churchill. 1929. Pp. xiv plus 301. Price, 10s. 6d. net.

THE third edition of *Malay Poisons and Charm Cures* has been thoroughly revised and partly rewritten. The Malayan lawyers and Civil Service men (for whom the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

book is specially intended) will much appreciate this edition, for it will be a reliable work of reference whenever they are confronted with Malayan witchcraft and folk-lore.

This book is divided into two main parts. The first part, which presents a detailed account of the charms, spells and black art practised in the Federated Malay States will be of interest to general readers as well, inasmuch as this is full of fantastic ideas and curious myths. The whole section has been written in a very pleasant and attractive style, in fact it reads more like a novel than a piece of serious literature.

The second part is of real scientific interest. It contains a collected account of the various poisons from the animal and the vegetable kingdom which the "bomor" or the "Malayan medicine man" deals with. There is much valuable information in this section for the pharmacologist and the pharmaceutical chemist. The nature and active principles of some of the poisons mentioned in the text have been partly worked out; but there is still a wide field for research in Malayan indigenous medicines and poisons.

The bibilography appended at the end of each chapter is a feature of note. Appendix No. 2, which gives a tabular classification of the poisonous plants with their natural orders, also needs special mention for it will be of use to botanists.

R. N. C.

A REPORT ON THE LEAGUE OF NATIONS INTERCHANGE OF HEALTH OFFICERS IN INDIA.—By Dr. A. L. Hoops, M.D., D.P.H., B.A., Principal Medical Officer, Straits Settlements. London: John Bale, Sons & Danielsson, Ltd. 1928. Pp. 80. Price, 5s. net.

THIS is a report on the League of Nations interchange of health officers in India which followed the Far Eastern Association of Tropical Medicine Congress in Calcutta in December 1927, when a party of medical officers of health from other countries toured India under the auspices of the Government of India, inspecting general public health measures, hospitals, medical and research institutions, and medical education. It will interest the medical reader in India as a bird's-eye view from the outside of what is going on in this country; but, as Dr. Hoops himself says, India is so vast that it is difficult to give a comprehensive review of even the medical and public health activities in this country.

Chapter I deals with population, agriculture and industries; Chapter II with the evolution of the Indian Medical Service and its present organisation. The present organisation of public health services in India is then considered, and an account given of the Indian Research Fund Association and the medical research institutes of India. Medical education is dismissed in two pages, but the Calcutta School of Tropical Medicine receives a chapter of four pages to itself. Hospitals and dispensaries in various provincial capitals are described, with photographs—which are unfortunately not labelled. The Mental Hospital at Ranchi is fully dealt with, and next comes a chapter dealing with the Indian prison system.

The rest of the report is given up to a miscellaneous series of subjects: leprosy in India; the sanitation of religious fairs and festivals; rural public health and the individual; irrigation and public health; the Asansol coal mines and their Board of Health; the work of the Kala-Azar Commission in Assam; the sanitation of New Delhi; malaria on the Assam tea estates; coolie immigration in Ceylon; voluntary Indian health and self-help organisations; and an account of the Mysore medical department.

We suppose that this report is of an official character. It has its interest for the medical reader in India, but we could wish that the subject had been dealt with in more detail. A book dealing with the whole subject of medical relief, medical education, medical research and public health in India is badly wanted. To some extent the *Souvenir on the Indian Empire*, published in connection with the Far Eastern Association of Tropical Medicine Congress, 1927, attempts this, and is far more interesting reading than Dr. Hoops' report; but there is scope for a still larger publication, written by joint authors with many years' experience of work in India and of India's problems.

R. K.

CHRONIC (NON-TUBERCULOUS) ARTHRITIS: PATHOLOGY AND PRINCIPLES OF MODERN TREATMENT.—By A. G. Timbrell Fisher, M.C., F.R.C.S. (Eng.). London: H. K. Lewis and Co. 1929. Pp. xii plus 232. Illustrations 186 contained in 93 plates and the text. Size Demy 8vo. Price, 25s. net.

MUCH literature has accumulated round the subject of chronic arthritis and yet the ordinary student and practitioner feel that they are not much the wiser! Too much has been made of certain accepted theories, as that of infection from chronic septic foci, without adequate proof in many cases; in other instances we have not even a theory to comfort us.

This work is welcome because the author approaches the subject from the basis of definite experimental research into the physiology and pathology of joints; in the past these have been greatly neglected. One aspect has not been sufficiently studied in this book, the climatic and other considerations which are responsible for the undeniable fact that most forms of chronic non-tuberculous arthritis are very much less in evidence among the inhabitants of warm and tropical countries. How much the climate has to do with this, and how much the manner of living, are well worthy of study.

Various classifications are suggested: a subdivision into chondro-osseous, synovial, and mixed; or a modified grouping into proliferative (rheumatoid arthritis) of synovial or mixed type, and degenerative (osteo-arthritis) of chondro-osseous and mixed type. When an infective or traumatic cause is known to exist, these can also be indicated. The differential diagnosis of arthritis in a tabulated form, as given in the *Ministry of Health Report, No.* 52, is referred to: rheumatoid arthritis, osteo-arthritis, climacteric arthritis, and gout.

The author makes an appeal for team-work in special clinics, to work out the various clinical and pathological findings in large series of cases. A chapter is given to etiology, and one to symptomatology, while a full description of the recognized methods of treatment occupies the last chapter under the headings of medical treatment, physiotherapy, manipulative and orthopædic measures, and surgical treatment.

Although we are still far from reaching a really satisfactory stage in our powers of diagnosis and treatment of chronic joint affections, our knowledge is definitely advanced by the author's work. The student and practitioner will welcome a book which deals with a difficult subject in a clear manner and which marks a definite advance in our knowledge.

F. P. C.

SUBSTANDARD LIVES AND THEIR ASSESSMENT IN LIFE ASSURANCE.—By Jehangir J. Cursetji, Medical Director, Oriental Government Security Life, Bombay. Pp. 66. Price, Re. 1-8 in India, 3s. 6d. in Great Britain and British Dominions, and 1 dollar in the U. S. A.

Substandard Lives and their Assessment in Life Assurance by Dr. Jehangir J. Cursetji, Medical Director to the Oriental Life Co., is a very interesting publication, and one which will be of considerable value to all who are interested in life assurance work.

The book is well arranged and the busy examiner can readily obtain the information he requires by referring to the list of contents and noting which chapter deals with defects in the system he is interested in.

Chapter VI on defects in the genito-urinary system is likely to be particularly helpful to examiners, but it is rather surprising that in dealing with the subject of albuminuria the author makes no reference to kidney efficiency tests.

Throughout the book frequent references are made to the opinions of European and American physicians, and one cannot help thinking that a more frequent expression of the author's own opinion would be of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Liver Extract B.D.H.

in the treatment of

Pernicious Anaemia

Experience in the ordinary course of general practice during the past few months confirms the observations of Minot and Murphy, and of others, that simple liver therapy (the administration of fresh liver or of a properly-attested powdered extract) never fails to restore the patient to normal health within two or three months, and that, provided the treatment be continued, there will be no relapse.

In a case reported recently where Liver Extract B.D.H. was used the blood count rose from 890,000 to 3,960,000 within one month.

Liver Extract B.D.H. is a freely-running powder; it is stable, uniform and highly-active. Moreover, it is palatable, and is as simple to administer as any meat extract.

It is made in the B.D.H. laboratories by a process tested and found efficient by the Medical Research Council, London. Thus, the properly-attested powdered product is always supplied when B.D.H. is specified.

Descriptive literature will be sent on request to either of the B.D.H. representatives resident in India :—

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
119, Parsee Bazar Street,
FORT, BOMBAY, No. 1.

THE BRITISH DRUG HOUSES LTD
LONDON

Liv. Ext /in/295

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TRADE MARK

'EPHETONIN'

BRAND

SYNTHETIC EPHEDRINE

$C_{10}H_{15}NOHCl$.

'EPHETONIN' is the hydrochloride of phenylmethylaminopropanol. **'EPHETONIN'** offers convenient oral administration in place of hypodermic injections of adrenalin in the treatment of

Bronchial Asthma
Respiratory Paralysis
Hay Fever
Hypotonia etc.

The action of "Ephetonin" is analogous to that of Adrenalin, but it is superior to this by reason of its more prolonged effect, its low toxicity, its effective absorption from the intestinal tract, the absence of habit formation and its stability in solution.

It is distinguished by

Therapeutic Potency **Low Toxicity**
Oral Administration **Constant Effect**

Unlike Adrenalin, it may be given not only subcutaneously but by the mouth. Solutions may be sterilised by heating.

DOSAGE: Commence with half a tablet, or $^1/_4$ gr. powder, twice or thrice daily, increasing the dose as required up to a maximum of a whole tablet, or $^1/_2$ gr. powder, three times a day.

PACKING: Bottles containing 25 tablets ($^1/_2$ gr.)
Bottles containing $^1/_2$ oz. powder
Boxes containing 6 × $^1/_2$ gr. 1 c.c. ampoules

E. MERCK CHEMICAL WORKS DARMSTADT (GERMANY)

Represented by Messrs. MARTIN & HARRIS Ltd., CALCUTTA, BOMBAY, MADRAS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

greater value; he must be in a position which gives him immense clinical experience in life assurance work, and also he probably has access to the Oriental records, from which very valuable statistics on substandard lives could be obtained.

On p. 36 he quotes Dr. Kinnier Wilson as stating that the risk of injury or of death in an epileptic fit is altogether minute. Some of us however have probably had experience of death due to injuries received during the fit, and in the present day with roads in their congested and dangerous condition it seems that this risk is likely to increase.

In Chapter II under blood pressures no mention is made of diastolic pressures; it is always difficult for an examiner to assess cases of high diastolic pressures, and also it would be very interesting to know what are to be considered normal blood pressures for Indians; it seems probable that they are normally lower than for Europeans, also possibly the normal pulse rate for Indians should be taken at a higher rate than the standard 72 per minute for Europeans.

In making his recommendations for loadings, the author frequently states that an addition of a certain number of years should be added to the age, but the severity of this loading would vary with the age of the proposer; for instance a man aged 20 years with a loading of three years would get off much more lightly than a man aged 40, with the same addition to his age.

The proofs do not seem to have been very carefully revised: on p. 13 we find aortic "observation" instead of "obstruction," and on p 57 "cholecystectomy" has been repeated, where "cholecystotomy" is obviously meant in the second case.

In conclusion, the author very rightly states that it is exceedingly difficult to assess substandard lives. This difficulty will always remain in India until more data are available, and until then all recommendations must be to a certain extent empirical. American methods of debit and credit have certain advantages, but they only supplement the clinical acumen of the examiner. What is really needed are statistics compiled from companies' Indian death claims. Very little original work has been done on Indian risks, and it is hardly fair, either to Indian proposers or to Companies operating in India, to judge their cases from European standards.

E. H.

Annual Reports.

ADMINISTRATION REPORT OF THE BALUCHISTAN AGENCY FOR 1927-28. CALCUTTA: GOVT. OF INDIA CENTRAL PUBLICATION BRANCH, 1928. PRICE, RS. 6-4-0.

THERE are certain items of medical interest in this report, mostly submitted by Lieut.-Col. L. J. M. Deas, I.M.S., Residency Surgeon and Chief Medical Officer. There were 42 hospitals and dispensaries working in the year as against 41 in the previous year; 604,053 patients were treated during the year; in-patients numbered, 12,191; whilst it is noted that the Church Missionary Society continued to do excellent work during the year. Tuberculosis is a problem in the Agency—most of the cases being imported from the Punjab or from Sindh, and the question of building a tuberculosis institute is under consideration. Operations performed numbered 17,274; whilst smallpox is so trivial a problem in the Agency that only 51 cases occurred during the year. An X-Ray Department and touring motor dispensary carried out good work during the year.

The Jail Department records a healthy year on the whole. The daily average number of prisoners was 426.6. The construction of a central jail for the Agency at Mach has been sanctioned and work on it was commenced during the year. In the meantime there is considerable overcrowding, and this had to be met by the transfer of some long time prisoners to such distant provinces as Ajmere, Hyderabad Deccan, Bareilly and Cannanore. The average expenditure on guard and maintenance per head was Rs. 211-7-6. At the district jails at Sibi and Quetta blankets and cotton clothing are manufactured by the prisoners.

SIXTY-SIXTH ANNUAL REPORT OF THE GOVERNMENT CINCHONA PLANTATIONS AND FACTORY IN BENGAL, FOR THE YEAR 1927-28. By C. C. CALDER, SUPERINTENDENT, ROYAL BOTANIC GARDEN, CALCUTTA AND OF CINCHONA CULTIVATION IN BENGAL, CALCUTTA: BENGAL SECRETARIAT BOOK DEPOT, 1928. PRICE, INDIAN, 13 ANNAS; ENGLISH, 1*s.* 3*d.*

THIS annual report is always of interest, despite the array of statistical figures presented, as it summarises the quinine situation in India. During the year the Linlithgow Commission took evidence on the agricultural state of India, and their recommendations with regard to cinchona cultivation in India, whether it is to remain a provincial subject, as at present in Bengal and Madras, or to become an imperial department will be awaited with interest. The problem obviously affects all-India, and the department should obviously become an all-India one, whilst the gravest problem to be faced is the finding and opening up of new areas suitable for cinchona plantation.

India's annual consumption of Government quinine totals about 60,000 lbs. whilst the reserve stocks in hand amount to over 400,000 lbs. This situation is not satisfactory, because it is obvious that much more quinine must be consumed in India if malaria in this country is to be controlled effectively. "Old established and reputable firms who formerly counted their sales in thousands of pounds saw them dwindle to hundreds, and could buy quinine on the market cheaper than they themselves were allowed to sell. Everything at present points to over-production if the effective demand only is thought of, and yet there is the realisation that the whole world's annual supply could be absorbed by India alone if the price was such as allowed of a ready sale," comments the report.

At Mungpoo climatic conditions were normal during the year, and the acreage was considerably increased. The average yield per acre was 3,264 lbs. Here, however, increasing difficulty is encountered in recruiting local labour, and the problem of recruiting local labour in the Darjeeling district will have to be faced. At Munsong an acutely epidemic disease affected the young seedlings, and is probably of fungoid origin. This infection chiefly affects younger plants and to some extent spares the well established ones. Labour difficulties have increased in this area also. "It would seem that the time is approaching when Government should become the direct employer of labour on these plantations." The harvest here was confined to thinnings and to the extraction of those trees which had died or had become unhealthy.

As a whole, the total acreage under cinchona plantation amounts to 3,161 acres, but forestry problems affect the cinchona yield. The total production of quinine sulphate (including that from imported Java bark) amounted to 46,845 lbs., and the total products, exclusive of converted products, was 58,371 lbs. No less than 95.5 per cent. of the available quinine in the bark was extracted—a very satisfactory figure. A new fire-proof building is being erected to store the increasing reserve of quinine held by the Government of India.

The following are further statistical details from the report:—

Year's expenditure, Rs. 2,57,378.

Harvest return for the year, Rs. 3,78,593.

Cost per lb. of quinine extracted from bark, Rs. 4-8-0.

Cost of extraction of quinine sulphate, Rs. 2,721 per lb.

Total cost of quinine per lb., extraction and manufacture, Rs. 7,521 per lb.

Wholesale selling rate of quinine per lb., Rs. 18.

Quinine sold during the year, total, 19,628 lbs.

Total receipts of the department, Rs. 5,38,202.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Total expenditure of the year of the department, Rs. 4,48,244.

Total earnings for the year, Rs. 5,80,520.

Provincial reserve of quinine at end of the year, 42,241 lbs.

Total value of stock carried over at end of year, Rs. 5,56,563.

It is to be noted that, in spite of a reduction in the selling rate of quinine tablets, the amount sold during the year was less than in former years; "the effective demand" concludes the report, "is only loosely connected with the price."

There were several changes of staff during the year; Mr. G. H. Fothergill is singled out for his excellent work as Assistant Manager, Munsong, during the year; and Mr. Thomas for sound management of the plantation under his immediate charge. Harkman Lama, overseer on the Mungpoo plantation and the oldest officer in the department, went on leave pending retirement, and it is noted that his retirement will be a serious loss to the department.

UNIVERSITY OF CALCUTTA. REPORT ON THE STUDENTS' WELFARE SCHEME (HEALTH EXAMINATION), FOR THE YEAR 1927. CALCUTTA UNIVERSITY PRESS, 1928.

THIS report deals with conditions which are now unfortunately only too familiar. During the year the committee investigated the conditions of students in four colleges, the Bangabasi College, the Post-Graduate classes, St. Xavier's College and Ripon College; and examined 2,161 students. Their complete data to date are based on the examination of a total of 14,866 students; and the committee report that they now consider that attention should be paid to the improvement of the health of students rather than to investigation into their state of health. Owing to financial difficulties the University is able to employ only one after-care officer, and at present the department can do little more than issue defect cards to students who are found to be suffering from any disease or are deficient or abnormal in any respect.

The number of students who are defective or diseased totals the appalling figure of 71 per cent., and only some 29 per cent. of students can be said to be really healthy. Defective vision affects 32.6 per cent.; and of these 63 per cent. are not provided with the necessary glasses; uncorrected vision is a most serious handicap to a student and we are glad to learn that the committee has taken special steps to have cheap glasses in nickel frames provided at concession rates by Messrs. B. K. Paul & Co. and the Sun Optical Co. Dental caries affects 8 per cent. of the students, whilst 18 per cent. suffer from bleeding and spongy gums, and a further 4 per cent from pyorrhœa. A dental clinic is badly wanted, but funds for this cannot be provided.

An interesting report, based upon the above wide range of figures, is given for the normal average Bengali student. He is about 66.4 inches in height, 112.2 lbs. in weight, with chest measurements of 33.1 and 31.4 inches. The cephalic index is 80.1, and he is brachycephalic. The hand grip as measured by Smedley's dynamometer is 39.19 kilos for the right hand, and 36.33 kilos for the left hand. The students at the Presidency, Scottish Churches', and St. Xavier's Colleges are above the average general standard; those of the other colleges below.

That there is a vital need for compulsory physical training of university students in Calcutta is clear, and this matter is at present under the consideration of the Bengal Legislative Council. During 1927-28 the University allotted Rs. 17,000 to different colleges for such training, and Capt. P. K. Gupta, I.M.S. (retd.), gave thirteen lectures to students on physical culture. The Rowing Club showed an average daily attendance of 22 members, whilst swimming is practised in the Deshabandhu Tank, Shambazar. The model dietary drawn up by Rai Chunnilal Bose Bahadur was circulated to the heads of all hostels in Calcutta and the *mofussil*, but difficulties were experienced in introducing it. The average cost is from Rs. 13 to Rs. 15 p.m., and many students are disinclined to change their habits.

This report tells of good work done, but it also shows the grave necessity for much further effort.

FIFTY-THIRD ANNUAL REPORT OF THE CHEMICAL EXAMINER'S DEPARTMENT, BENGAL, FOR THE YEAR 1927. CALCUTTA: BENGAL SECRETARIAT BOOK DEPOT, 1928. PRICE, INDIAN, RE. 1-2; ENGLISH, 1*s.* 10*d.*

THE following is a brief résumé of the more important items of interest in the 1927 Report of the Chemical Examiner's Department, Bengal.

In the year under report 7,557 articles were examined in the department as against 7,021 articles in the previous year. This shows an increase of 536 articles.

Of the 7,557 articles examined during 1927, 4,831 were for Bengal, 365 for Assam, 2,179 for Bihar and Orissa, 84 for Government of India departments, 31 for the Chief Inspector of Explosives in India, 1 for the District Magistrate of Rangoon, and 66 miscellaneous.

During the year under report the analyses of excisable drugs were taken over by this office on behalf of the Excise Department, Bengal, with effect from the 14th April, 1927, under the orders of Government. This work was originally carried out by the Chemical Examiner for Customs and Excise, Calcutta. The number of analyses carried out under this head amounted to 1,045.

Medical and Scientific.—Under this head work has been carried out in connection with the cholesterol content of normal blood for standardisation purposes and also on the cholesterol content of leprosy blood. Researches have also been made in connection with the estimation of antimony and in the preparation of activated cholesterol for leprosy treatment. The results of the work on cholesterol have been published in the *Indian Journal of Medical Research*, January 1928. All expenses in connection with this work have been met by a grant given by the Research Fund Association.

Opinion cases.—The following are some of the opinions recorded in some special cases referred to this department:—

(1) Opinion regarding the fixing of limits for aconite, arsenic, cannabis indica, cantharidis, opium, etc., in medicinal preparations containing these drugs.

(2) As regards the standards for the cholesterol content of blood and a satisfactory method for its estimation.

(3) As to the physiological effect of the juice obtained from galchin or golainchi.

(4) Questions relating to the loss of weight in samples of quinine sulphate by evaporation of the water of crystallisation.

(5) Questions relating to testing of food-stuffs and common adulterants in ghee and mustard oil.

(6) The relative merits of ether and chloroform for anæsthetic purposes with special reference to their keeping properties in a hot climate.

(7) As to the cause of precipitation of strychnine in a bottle containing strychnine hydrochloride.

(8) As to whether small quantities of osmic acid (osmium tetroxide) securely packed as per certain specific conditions, may be allowed to pass through the Inland Post.

(9) As to how the floor of a kerosene shed, heavily impregnated with this oil can be cleansed.

General Department (including Excise).

In the General Analytical Department 3,058 examinations were made as compared with 2,296 for the previous year; the increase is due to the transfer of the excise work to this department.

Of the above 3,058 examinations, 2,566 were carried out for Bengal, 66 for Assam, 277 for Bihar and Orissa, 74 for Government of India departments, 31 for Chief Inspector of Explosives in India, 1 for District Magistrate of Rangoon, and 43 miscellaneous.

Excise Branch (General Department).—This was opened on the 14th April, 1927. During the year under

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOVRIL in INSOMNIA

Writing in the "Lancet" of October 8th, 1927, a London Nerve Specialist says:

> "*It is unwise to go to bed on an entirely empty stomach, since it is generally accepted by physiologists that cerebral anæmia plays some part in the mechanism of sleep. A meal tends to produce drowsiness . . . (compare the desire of most animals to sleep following a meal).*"

He goes on to recommend, *inter alia*, a cup of Bovril and biscuits half an hour before bedtime. Bovril provides the required sustenance in a simple, palatable, and easily digestible form, thus predisposing the system to sound, healthy sleep.

BOVRIL Limited cordially invite any medical man visiting England to inspect their factory at any time. 146/166, Old Street, London, E.C.1.

BOVRIL

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A WORTHY PRODUCT

FOR INDIA.

Doctors can easily prove now to their entire satisfaction the many advantages of Petrolagar over salines or cathartics for the treatment of constipation.

A simple test will prove its merit—prescribe one or two tablespoonfuls night and morning for five of your patients—the results will prove most gratifying.

Write for interesting literature to Messrs. H. J. Foster & Co., Ltd., P. O. Box 202, Bombay, our Distributing Agents for India, Burma and the Malay States.

"Petrolagar" is manufactured only by Deshell Laboratories, Ltd.

Braydon Road, London, N. 16.

Petrolagar Alkaline is specially valued in the Tropics as by its bland and mildly alkaline action it allays inflammation and has a soothing effect on the bowel. The oil present is not absorbed, therefore it is not heat producing. Petrolagar is manufactured by a special mechanical process which requires no handling.

Petrolagar

'Petrolagar' is the trade mark distinguishing the fine emulsion of mineral oil and agar-agar, issued in four varieties: Plain, with Phenolphthalein, Alkaline and Unsweetened, manufactured only by Deshell Laboratories, Ltd., London, N.16.

CC-0. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

review the following number of samples were dealt with by this section as well as by the General Department.

Cocaine.—Two thousand one hundred and seventy-eight samples of cocaine were examined during the year as compared with 1,460 for the previous year, showing an increase of 718 samples.

Of the above 2,178 examinations, 1,379 were carried out for the Excise Department, Bengal; 582 for the Presidency Magistrate, Calcutta; 8 for the Commissioner of Police, Calcutta; and 209 for Bihar and Orissa.

In addition to the examination for the presence of cocaine, a large number of the samples had to be assayed as to their fitness for medical use in accordance with the British Pharmacopœia specifications. Many of the samples were found to be grossly adulterated and none were found to conform to the British Pharmacopœia standards.

Opium.—One hundred and ninety-eight samples of opium were examined during the year as against 41 during the previous year, showing an increase of 157 samples. In addition to the detection of opium, practically all the samples had to be assayed for prosecution purposes under the Excise Act.

In connection with the above 198 samples, 175 examinations were carried out for Excise, Bengal; 17 for Excise, Assam; 4 for Excise, Bihar and Orissa; and 2 for the Opium Factory, Ghazipur.

The two samples from Ghazipur (provision opium) had to be assayed for moisture, ash, morphine, narcotine, codeine and water soluble extract at 100°C.

Preparations of opium.—Under this head 26 samples of chandu, 7 samples of imshi, 4 samples of kafa, 1 sample of morphia and 2 samples of "chlorodyne" and "camphorodyne" were examined.

Bhang and its preparations.—Eight samples of bhang, 5 samples of charas and 5 samples of modak were examined during the year under report. The physiological activity of these samples was assayed on cats.

Bakhar.—Thirty-three samples of bakhar were examined in the General Department and 16 were examined in the Medico-legal Section. This substance is largely used as a fermenting agent in the preparation of pachwai. Unfortunately several samples have been found to be contaminated with aconite, and fatal cases have occurred from drinking liquor fermented by this means.

Articles of food.—Under this head 18 samples of ghee were examined, of which only 6 samples conformed to the requirements of the Food Adulteration Act; 4 samples of butter of which 3 conformed; 4 samples of milk of which none conformed; and 15 samples of mustard oil of which 4 conformed to the Act.

Work under the head of food-stuffs is gradually diminishing since the establishment of the Public Health Laboratory. Cases on appeal will, however, have to be dealt with in this department.

Thirty-four samples of drugs were analysed during the year under report; practically all these analyses were undertaken for the Medical Store Depôt, Calcutta, in connection with the British Pharmacopœia specifications of drugs for medical use.

Medico-legal Notes.

The following notes on medico-legal cases were supplied by Senior Assistant Surgeon Hiralal Sinha, B.A. L.M.S., who was in charge of the Medico-legal Department:—

Poisoning by carbolic acid (suicidal?).—The viscera of a European male, aged 70 years, were forwarded by the Medical Officer of Barrackpore with the history that the victim was found dead in bed in a garden. On post-mortem examination the mucous membrane of the stomach was found white and corroded but the Medical Officer could not give any definite opinion as to the cause of death. Carbolic acid and alcohol were detected in the viscera.

Poisoning by Arsenic.—(*a*) *Arsenic in a charred body.*—The Assistant Surgeon of Perojpur forwarded for examination a quantity of burnt and charred viscera said to be the remains of the stomach, liver, and kidneys of a Hindu female aged about 24 years, whose burnt body was removed from the funeral pyre by the police, as she was reported to have committed suicide by poison. Arsenic was detected in the viscera. It may be noted that arsenic, though a volatile poison, has often been detected in partially burnt bodies and even in partially burnt bones.

(*b*) *Arsenic (slow elimination).*—The Veterinary Assistant Surgeon of Mymensingh forwarded the viscera of a bullock with the history that the animal was alleged to have been poisoned on the 9th October and died on the 18th October. Arsenic was detected in the viscera. The case illustrates the slow elimination of arsenic from the system.

(*c*) *Homicide by arsenic and strangulation.*—The viscera of a male child, aged 3½ years, were forwarded by the Sub-Assistant Surgeon of Jamalpur (Mymensingh) who reported post-mortem signs of strangulation. The stomach was found empty and healthy and the intestines contained soft yellow fæces. Death was ascribed to strangulation but arsenic was detected in the viscera.

(*d*) A similar case was also forwarded by the Civil Surgeon of Bakarganj, the deceased being a Hindu female aged 16 years. There were post-mortem signs of strangulation and death was ascribed to strangulation by the Civil Surgeon. Arsenic was also detected in the viscera.

Strychnine poisoning from a quack remedy.—The Assistant Surgeon of Jorhat forwarded the viscera of two female children aged 3 and 5 years respectively with the history that their father gave them some powder alleged to have been supplied by a bhutia for worms. Soon after taking the powder both the girls began to struggle and had convulsions and died within half an hour. The medical officer could not give any opinion as to the cause of death. Strychnine was detected in the viscera of both.

Poisoning by nux vomica (in mistake for opium).—The Assistant Surgeon of Darrang forwarded the viscera of an adult female with the history that her husband brought some stuff from another person who alleged it was opium and it was taken by his wife. She soon developed symptoms of strychnine poisoning and died. Strychnine and brucine were detected in the viscera.

Atropine poisoning (fatal).—(*a*) The viscera of an unknown male found lying at a street crossing in Calcutta were forwarded by the Coroner of Calcutta, as the medical officer who performed the post-mortem examination could not give any definite opinion as to the cause of death. Atropine was detected in the viscera.

(*b*) *Drugging by atropine.*—The Commissioner of Police, Calcutta, forwarded the stomach washings of two women of the town and a small quantity of yellowish powder found in their room, with the history that three up-country young men visited them and offered them liquor, meat, puri, etc., brought from outside. Soon after taking the food they became unconscious and were removed to hospital where one of them died the next day, and the other recovered. Atropine was detected in the stomach washings of both as well as in the yellowish powder. The viscera and urine of the deceased were forwarded by the Coroner of Calcutta for analysis. No poison could be detected in the viscera but atropine was detected in the sample of urine.

Hydrocyanic acid in fodder.—The Veterinary Assistant Surgeon of Dinapur forwarded in the month of June the viscera of two buffaloes and a quantity of young green grass, said to be "Burroo grass," for analysis, with the following history:—Two animals out of a number of buffaloes and buffalo calves while grazing on the military grass farm at Dinapur became very ill, fell down, and died in a semicomatose state within half an hour from the onset of the symptoms. Hydrocyanic acid was detected in the specimen of the grass sent but no poison could be detected in the viscera of the two animals. Later in the season further samples of this "Burroo grass" were examined but no hydrocyanic acid could be detected. Identification of the plant was carried out by the Botanical Office and was found to be *Sorghum halepense Pers.* (vernacular *Baru, Kala Mucha*). Other cases though rare have been referred

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to this department previously where young plants were found to contain hydrocyanic acid (probably a cyanogenetic glucoside).

Hydrocyanic acid poisoning (suicidal).—The viscera and urine of a Hindu male aged 22 years were received from the Coroner of Calcutta with a history that the deceased was found lying dead in his room, the door of the room being bolted from inside. The medical officer could not give any opinion as regards the cause of death. Hydrocyanic acid was detected both in the viscera and in the urine.

Croton poisoning (homicidal?).—The Deputy Commissioner of Police, Calcutta, forwarded the stomach washings of two brothers who felt a burning sensation in the stomach and started vomiting after taking some cooked dal and bread, which were also forwarded. They recovered after treatment in hospital. Croton was detected in the stomach wash of one and in the cooked dal.

Aconite poisoning (by taking liquor).—(*a*) A case of multiple poisoning by aconite was referred by the Deputy Commissioner of Police and the Coroner of Calcutta, with the following history. Ten people drank some liquor mixed with soda water from a bottle labelled "Beehive Brandy" which was purchased by one of them along with several empty bottles. They all felt an immediate irritation in their throats and they vomited. They were removed to hospital, where their stomachs were washed. Four, however, died. The viscera of the four deceased were forwarded by the Coroner of Calcutta together with the stomach washings of all of the ten victims; the bottle labelled "Beehive Brandy" with a portion of its contents, was forwarded by the Deputy Commissioner of Police, Calcutta, for analysis. Aconite was detected in the viscera of two of the victims and in the stomach washings of 8 of them as well as in the liquor labelled "Beehive Brandy."

(*b*) *Aconite poisoning (homicidal).*—The Sub-Assistant Surgeon of Rajbari, Faridpur, forwarded the viscera of a boy aged 12 years with the history that the deceased was offered by one of the "antiparty" some "Gazi's Sinni," on taking which he complained of tingling in the throat, pain in the stomach, and died after half an hour. Aconite was detected in the viscera.

Lieut.-Col. T. C. Boyd, F.R.C.S.I., D.P.H., F.I.G., I.M.S., held charge of the department during the year under review.

KING EDWARD VII MEMORIAL PASTEUR INSTITUTE AND MEDICAL RESEARCH INSTITUTE, SHILLONG. THE ELEVENTH ANNUAL REPORT FOR THE YEAR ENDING 31ST DECEMBER, 1927. LIEUT.-COL. J. MORISON, I.M.S., DIRECTOR. SHILLONG: PRINTED AT THE ASSAM GOVERNMENT PRESS, 1928. PRICE, 1*s.* 3*d.* or 13 ANNAS.

DURING the year 1,142 patients came for treatment; of these 1,100 cases were Indians and 42 Europeans. Sixty-four others were advised that treatment was unnecessary as the bite did not penetrate the skin or because the dog was not suffering from rabies 10 days after the bite. Eleven persons discontinued treatment of their own accord. No further information regarding them is available and these cases are not included in the statistics.

Four more cases developed hydrophobia during treatment. These 4 patients arrived 13, 20, 24 and 88 days respectively after being bitten. They form 26.7 per cent. of the total deaths from hydrophobia among persons coming to the Institute, an unusually high proportion. These deaths, though excluded from the general statistics, are important for they are an index of the accessibility or otherwise of an Institute. For example, when treatment was available only at Coonoor (the Pasteur Institute for the Madras Presidency) the deaths during treatment among 33,253 persons was 13.2 per cent. of the total mortality. After centres for antirabic treatment had been established throughout Madras, the deaths during treatment among 19,263 persons fell to 6.3 per cent. of the total mortality. Though deaths during treatment are not an index of the efficacy of the treatment itself, it is important that they be not overlooked as our aim should be to make the treatment so accessible and so thoroughly appreciated that the only deaths during treatment are those exceptional cases who develop the disease less than three weeks after the bite.

The number of patients treated this year is 275 less than during the previous year.

Of the total, 1,106 persons came from Assam and 36 from Bengal.

Out of the 1,142 persons who were treated reports have been received from 1,110. These reports should be sent to the Institute on post cards three months after the completion of treatment. In 305 instances the information did come soon after the lapse of three months, but in 805 cases the information was sent much later—from 4 to 13 months after treatment; each case failing to report had been followed up. We have failed to get information in only 32 cases or 2.8 per cent. of the total.

Among the 1,142 cases there were 11 deaths, giving a mortality of 0.96 per cent. The number of failures, that is to say, patients dying of hydrophobia subsequent to 15 days after the conclusion of treatment, is 6, giving a failure rate of 0.52 per cent.

The proportion of persons licked on scratches and abrasions is small. In this class came 26 Europeans and 44 Indians or 0.61 per cent. of the whole. A superficial bite in some Institutes is interpreted as a bite which does not penetrate the skin. The drawing of blood is evidence of penetration through the skin and the possible implantation of the virus in a region richly supplied by nerves and is sufficient to place the bite in the class of deep bites. In such Institutes the class of superficial bites is limited to scratches and abrasions by the teeth. In this Institute this rule does not seem to have been followed and superficial bites include numbers of bites which in other Institutes are classed as deep. This is one of the points on which uniformity of practice at various Institutes might be attempted. In our statistics for this year it happens that the definition of superficial and deep does not affect the mortality; for all the 11 fatal cases had really deep bites in the less technical sense.

A new feature in this year's statistics is the division of the Indian cases arriving during the first week into 8 classes those arriving on the day of the bite (0 days late) and on the 1st, 2nd,.....7th day after being bitten. Among 1,100 Indians not a single case arrived at Shillong for treatment on the day of the bite. Out of 316 cases arriving during the first 4 days after the bite there was one death. Out of the 240 cases who arrived on 5th, 6th and 7th day there were three deaths. These four cases died in 25 to 31 days after being bitten and on them and on one other case arriving 10 days late and who died on the 38th day, there is no evidence that the treatment had any effect whatsoever. In the remaining six fatal cases the interval between the bite and the death was from 52 to 156 days. There is a gap of 14 days between the last of the first group and the earliest of the second group on whom possibly treatment had the delaying effect which was demonstrated by Lieut.-Col. McKendrick (sixteenth annual report, Pasteur Institute, Kasauli). The numbers are small but they illustrate a feature of antirabic treatment of which two explanations have been given (*a*) that in the first group the virus has been at once planted in a nerve where it is shielded from the action of the protective bodies generated by the treatment, and (*b*) that there are strains of virus against which the strain of vaccine used in a particular Institute has no effect. It is one of the grave handicaps of treatment at a remote Institute that it has hitherto been impossible to investigate these strains. It would be of great value if medical officers under whose care these fatal cases come would procure for us strains of the virus.

As the figures stand, however, they illustrate once again the benefit of early treatment; among 705 Indians arriving during the first week the mortality was 0.3

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

intestinal infections

In the tropics gastric and intestinal disturbances in one form or another such as sprue—enteritis—colitis—occur with monotonous regularity, usually from fly-infected milk.

In treating these conditions it is essential to prescribe a milk-food providing the necessary nourishment, without risk of irritation, or additional infection.

Glaxo answers this standard. It is guaranteed free from all harmful bacteria, and cannot become fly-infected if the lid is replaced after the required quantity is taken from the tin.

Glaxo is more easily digested than ordinary milk, because the process of manufacture changes the caseinogen so that in contact with the gastric juice, it forms—instead of the dense, leathery curd of cow's milk—a light, flocculent precipitate, which is non-irritant and easily absorbed.

Glaxo

The Vitamin Milk-Food

Literature and information will gladly be sent by

H. J. FOSTER & Co. Limited
P.O. Box 202, Bombay
P.O. Box 2257, Calcutta

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

When ovarian therapy is indicated

℞

THYRO-OVARIAN CO.

(HARROWER)

Because :

1. It is a complete product—it is directed at the whole problem, the pituitary and the thyroid, as well as the ovaries.
2. It reaches farther—the ovarian ingredient embodies all the active principles—none are removed by defatting—none are destroyed in the process.
3. It stands the clinical test—gives lasting results in a large percentage of cases, and has done so for the past ten years.

STILL BETTER RESULTS IF YOU PRESCRIBE THE CYCLIC DOSAGE :

Ten days before expected flow give 2 sanitablets t. i. d. before meals. At onset of menses omit for 10 days, then give 1, t. i. d. for 10 days. Repeat for several periods.

THE ENDOCRINE LABORATORY, SIMLA.

ENDOCRINES LIMITED,

WATFORD, HERTS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

per cent.; among 395 arriving after the first week the mortality was 1.77 per cent.

This year among Indians only 98 were bitten through clothing; among these there were no deaths.

Excluding superficial bites and bites through clothing, 279 cases whose wounds had been cauterised had a mortality of 0.72 per cent. and 297 cases whose wounds had not been cauterised had a mortality of 3.03 per cent.

A feature of the cases arriving at Shillong is the number of cases arriving with large septic sloughing wounds. Such wounds were rarely seen at the Pasteur Institutes of Bombay and Rangoon which draw their cases very largely from near at home, but they are also a feature of the cases at another hill Pasteur Institute (Kasauli). They are not due to the special severity of the bites coming to this Institute but to the inadequate dressings these bites receive before they are sent on their journey and the enforced neglect during the period, often extending for a week or more, when the patient is trying to get here. Small deep tooth marks are not efficiently cleaned and dressed. After cauterisation, if this is done, the wound may not bleed and gives no indication of the extensive sloughing that may follow the implanted septic infection. Every tooth mark or wound small or great that is cauterised should be carefully dressed.

In only two cases was a jackal bite fatal. Five out of 11 fatal cases were children of 7 years and under.

Owing to the success attending the treatment of kala-azar by antimony compounds in the plains and the number of centres for such treatment which Government has established, the cases which now come to this Institute are doubtful cases for diagnosis and cases which have resisted the treatment administered elsewhere. The emptying of the experimental ward for kala-azar, crowded to overflowing less than two years ago, is itself a tribute to the usefulness of this ward and the success of the investigations carried out by former Directors. It is very desirable that the ward should now be open for cases with diseases other than kala-azar, e.g., chronic dysentery and sprue, on which researches are now being carried out.

The total number of routine examinations was 2,512 as against 2,948 in 1926. For a province like Assam too little use is made of the Wassermann reaction for syphilis, a test essential for the diagnosis and adequate treatment of the disease.

Throughout the year the Institute has distributed prophylactic vaccine for influenza, enteric fever and cholera prepared by the Central Research Institute, Kasauli. The following amounts were issued.

Influenza	..	..	..	23,480 c.c.
T. A. B.	..	..	..	3,580 „
Cholera	..	..	..	4,19,380 „

The demand for cholera vaccine was so great and at times so urgent that the Government of Assam at the close of the year requested this Institute to resume its manufacture.

Correspondence.

SUDDEN DEATHS IN YOUNG FEMALES.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I should be much obliged if any of your readers could enlighten me on the following points:—

(*i*) Whether sudden deaths from heart failure are common or likely among young female patients of age 16 to 25; whether such deaths can occur at any time, day or night, during waking or sleeping hours; whether anæmia in such women can be a cause of sudden and immediate death by causing cardiac, cerebral, or pulmonary emboli; or whether a sudden attack of angina pectoris can cause sudden death in such a type of patient? Any reference to standard works of medicine would be welcome.

(*ii*) Whether it is the duty of medical men to report all cases of sudden deaths—whether due to natural causes, as well as those due to unnatural causes—to the police authorities; or only such cases of sudden death in which poisoning is suspected, or where the true cause of death is in doubt?—Yours, etc.,

C. G. MAHADEVIA, M.B., B.S.

JERMAHAL, BOMBAY,
POSTAL DISTRICT 2,
27th November, 1928.

[*Note.*—Rupture of an ectopic gestation might lead to such a sudden death, perhaps.—EDITOR, *I. M. G.*]

THE STERILIZATION OF SYRINGES.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I should be much obliged if any of your readers would let me know through your columns of any suitable, but safe and surgically reliable, technique for the best method of keeping "Record" hypodermic syringes and needles so that they may be instantly available at the bedside for immediate use without previous sterilization.

Do you consider the following method of sterilization safe with regard to asepsis?—viz., a small quantity of rectified or methylated spirit is drawn up into the syringe through the needle and then ejected, repeating the process say five to ten times? If not, will you please suggest any simple method (other than boiling) which will effectively sterilize both syringe and needle for immediate use in the emergencies of a busy practice at the bedside?—Yours, etc.,

JYOTI DHUR ROY, B.SC., M.B.

ALIPORE P. O.,
CALCUTTA.
4th February, 1929.

[*Note.*—We have known doctors to keep their hypodermic syringes, with the parts taken apart, permanently in a solution of 1 part of lysol in 9 of rectified spirit, and then rapidly to rinse the syringe through with rectified spirit to get rid of the lysol before using it; but whether such a procedure could be relied upon to get rid of spore-bearing organisms is doubtful. —EDITOR, *I. M. G.*]

SUBCUTANEOUS INJECTION OF OILS OR OILY PREPARATIONS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—It is said that any oil when injected subcutaneously is hardly absorbed at all. Hence camphor in oil is not of much use when so injected.

Is it the same case with oil of hydnocarpus when infiltrated subcutaneously? If so, can one expect any very good result from subcutaneous injection of oils, or oily preparations?—Yours, etc.,

A. F. W. DACOSTA, F.R.C.S., D.T.M., I.M.S.,
Civil Surgeon.

BILASPUR, C. P.
Dated the 25th January, 1929.

[*Note.*—When camphor is given rapid stimulation is usually required; for this camphor in oil is unsatisfactory. In the case of hydnocarpus oil such rapid absorption is not necessary. Dr. E. Muir informs us that absorption of this oil takes place in 3 days to 2 weeks.—EDITOR, *I. M. G.*]

A SIMPLE RAT TRAP.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I thing that the following method of rat trapping may be of some interest to your readers as it is extremely simple and effective.

The top is removed from a kerosene tin which is then sunk in the ground so that the top of the tin is flush with the ground level. The tin is then half filled

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

with water. This is all that is necessary. The rats in their efforts to get to the water, fall into the tin and cannot get out. By this means 2 to 5 rats per tin per night have been caught in this district. As soon as the nightly catch fails, which it usually does in 4 to 5 days, the site of the tin is changed.

Tins should be sunk in places where other supplies of water are not readily available, and the tops of the tins may be camouflaged with leaves or straw.

The advantages of this very simple method are that the materials are available in any village, the method is fool-proof, no bait is required, tins need not be handled, the rat fleas are immobilised if not drowned, and the kerosene tins are cheaper than traps.

The method was first introduced by Dr. K. A. T. Martin in South Africa, but as it does not appear to be known in India, I thought some of your readers might care to try it.—Yours, etc.,

C. J. STOCKER, MAJOR, I.M.S.,
Civil Surgeon.

HOSHANGABAD,
25th February, 1929.

A CASE OF ACUTE VAGINISMUS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Will you or any of your readers kindly suggest any practical way of treating the following condition?

I have a patient who is a young Bengali girl of 20 quite healthy and robust. She was in love with a healthy young man, whom she married some two years back. Both the husband and the wife deny a history of even a single act of successful coitus, since their marriage. This being a very obstinate case of vaginismus, I have carefully gone into the history of the case but have failed to elicit any fact to prove that the vaginismus was due to ignorance on the part of the husband or due to any psychical factor. Both the husband and the wife are fairly educated and are of "advanced views." Any attempt at examination per vaginam without complete surgical anæsthesia is impossible. A gynæcologist was consulted who examined the patient under chloroform anæsthesia. The vagina was found to be fairly dilatable and no local abnormality could be found. The vagina was dilated several times under chloroform anæsthesia without any effect. Cocaine suppositories could not be inserted (without surgical anæsthesia) on account of the acute vaginismus. Textbooks suggest that pregnancy may cure it. But how is it possible to bring about pregnancy in this case?—Yours, etc.,

JYOTI DHUR ROY, B.SC., M.B.

ALIPORE P. O., CALCUTTA.
28th February, 1929.

ACCIDENTAL SUFFOCATION IN A WELL.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—The following particulars of the accidental deaths of five persons from suffocation in a newly constructed well may be of interest to your readers. I held an official investigation into the circumstances under orders of the Inspector-General of Civil Hospitals, Bihar and Orissa, and the report is dated the 6th July, 1928.

The well was situated in the village of Dhanauti, near Sewan in Saran District. It had been under construction for some three months when the accident occurred. First a pit some 10 feet deep was sunk, then the well was commenced at the bottom of this pit, and had been sunk to a depth of about 20 feet, making some 30 feet below the surface in all; masonry work, consisting of burnt brick and clay had also been applied to a height of about 16 feet. A working gang of six persons had been at work daily for a fortnight on the well without accident.

On the afternoon of the 24th June, 1928, a boy aged 14 or 15 years was sent down to the bottom of the well to bring up an iron implement which had slipped. The depth of water in the well at the time was about 4 feet. The boy suddenly became suffocated and died (his body being subsequently found standing upright with the water reaching only to his shoulders). The rope to which he was tied broke.

A second individual next went down the shaft of the well with a rope to try and rescue the boy, but was suffocated and dropped into the water. A third then went down, dangled his legs in the water and tried to grasp the two still living bodies between his knees. He suddenly felt suffocated, however, and shouted to be drawn up. This man recovered; he states that he thinks the two were still living when he tried to pick them up, but that the water smelt horribly, and that he was in imminent danger himself of suffocation. Two other men followed him in turn down the well in an attempt to rescue the first two; but both became suffocated and dropped into the water. A sixth man was lowered into the shaft, but found himself suffocating when within a few feet of the surface, and shouted to be drawn up. This man was the second of the two survivors.

The well was sunk inside a walled-in yard, the enclosure walls being about 5 feet high, and with rooms on one side of the courtyard. Persons living in these rooms have not been affected at any time. Within 20 feet of the pit in the enclosure is a feeding platform for bullocks; these bullocks being still well. The site of the well had previously been used for collection of rubbish, whilst a saltpetre manufacturing godown at one time existed on the site. Fourteen years previously a brewery existed about 120 yards from the well, and there is a burial and burning ghat for Hindus about 200 feet west of the well.

On approaching the well, one noticed a strong smell of sulphur, and gas was seen to be actively bubbling up from the water in the well. Post-mortem examination on the five bodies was conducted by Assistant Surgeon M. N. Pal of Sewan some 24 hours after death, and he came to the conclusion that death was due to suffocation from poisonous gases, and not drowning. In each case dark red fluid blood was found in the right side of the heart, cyanosis was present, and in the stomach coffee-ground-like substance. In two of the bodies water was also present in the stomach, but death does not appear to have been due to drowning.

An empty hydrogen peroxide bottle was lowered into the well in the hope that the gases present would displace the air in it; the bottle was left *in situ* for fifteen minutes, then drawn to the surface quickly and immediately sealed with the special air-tight stopper used for hydrogen peroxide bottles. A second similar bottle was filled with water from the well, and similarly sealed. These samples were sent to the Chemical Examiner at Calcutta.

Three coins—a silver rupee, a nickel one anna piece, and a copper pice—were placed in the bottom of a bucket of water drawn from the well for ten minutes. All three showed a black coating, evidently a sulphide. These were also forwarded to the Chemical Examiner.

The Chemical Examiner reported that sulphuretted hydrogen gas in quantity was detected in the bottle of water withdrawn from the well; and carbon dioxide was detected in the bottle of air from the same source. The black stains on the three coins were due to the sulphides of the respective metals concerned.

I have not been able to find out how the water of the well became so intensively contaminated with sulphuretted hydrogen, but the surroundings of the shaft were anything but satisfactory from a hygienic point of view. The well was filled in with earth and has never been reopened.

My thanks are due to Colonel Willmore, I.M.S., Inspector-General of Civil Hospitals, Bihar and Orissa, for kind permission to publish these notes on the occurrence.—Yours, etc.,

RAJESWAR PRASAD, L.M.S.,
Assistant Surgeon.

ARRAH,
22nd February, 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Note for the Medical Profession

A
Powerful Non-Toxic Germicide

EFFECTIVE coal-tar antiseptics are severely restricted in clinical use by their damaging action on tissues. Except in a few instances, their usefulness lies mainly in the disinfection of utensils, etc.

An antiseptic of equal germicidal efficiency, and without destructive action on tissues could be employed in clinical practice for purposes and with effects hitherto unprecedented. *MONSOL IS SUCH AN ANTISEPTIC.*

GERMICIDAL EFFICIENCY

Tested in the presence of organic matter, the germicidal efficiency of Monsol for fæcal bacteria greatly exceeds that of other representative antiseptics. The selective action of Monsol classes it apart from any antiseptic of similar origin, in that its efficiency is greatest for the Gram-positive cocci. Monsol kills the Streptococcus Pyogenes in a dilution *more than* 10 *times greater* than phenol or lysol.

TOXICITY

Monsol is absolutely non-irritant to the skin. Effective solutions of Monsol can be applied to mucous membranes. Large amounts of pure Monsol given by the alimentary tract to animals have failed to demonstrate any poisoning action. Monsol has been given intravenously to animals in amounts equivalent to no less than 1-600th of the total blood volume with only transient ill-effects. No other antiseptic exists which possesses these properties.

Monsol
Liquid for dressings, douches, packs, and all sick-room purposes

Monsol Ointment

MONSOL
BRAND
GERMICIDE AND DISINFECTANT

Monsol Capsules
Keratin-coated for intestinal disinfection

Monsol Throat Pastilles

Obtainable of all reputable Chemists in India.
Selling Agents in India: Imperial Chemical Industries (India), Ltd., Calcutta, Bombay, Madras, Karachi, Rangoon, Cawnpore, Belgaum, Cochin, and Ahmedabad.
Manufacturers: The Mond Staffordshire Refining Co., Ltd., 47, Victoria Street, London, S. W. 1.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BISEDIA

A combination of Schacht's Bismuth and Pepsina Liquida with Sedatives.

Indicated in

Acute Dyspepsia
Gastric Ulceration
Vomiting of Pregnancy
Gastric Hyperasthenia

DOSE.—One drachm in a little water just before meals.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
Bristol, England.

BISMUTHUM CRYST.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A CASE FOR DIAGNOSIS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the case for diagnosis reported on p. 118 of your issue for February 1929 by Dr. M. D. Pillai, I think the case to have been one of calcium deficiency. The unconsciousness, clenched teeth, closed eyes, etc., are manifestations of tetany. An injection of adrenalin, instead of digitalin and strychnine, might have fixed the calcium ions. Parathyroid and calcium by the mouth might have restored the calcium metabolism to normal. Unless such measures are taken there may be a chance of a recurrence of the symptoms in the patient.—Yours, etc.,

CH. KRISHNAMURTY, L.M.P.

CENTRAL JAIL, RAJAHMANDY,
28th February, 1929.

A CASE FOR DIAGNOSIS. *CORRIGENDUM.*

[In connection with the above case, reported on p. 118 of our issue for February 1929, Dr. Pillai has asked us to publish the following corrigendum; line 17; in place of 'with my consultation,' please read 'without my consultation.' Line 30; instead of 'Tinct. hyoscy. ℥ss. please read 'Tinct. hyoscy. ʒss.'—ED., *I. M. G.*]

Service Notes.

APPOINTMENTS AND TRANSFERS.

Lieutenant-Colonel W. J. Powell, M.D., I.M.S., Inspector-General of Prisons, Central Provinces, is appointed to officiate as Inspector-General of Civil Hospitals, Central Provinces, in addition to his own duties, with effect from the 21st February, 1929, and until the date on which Lieutenant-Colonel W. V. Coppinger relieves him of the additional duties.

Lieutenant-Colonel W. V. Coppinger, D.S.O., M.D., F.R.C.S.I., I.M.S., Professor of Ophthalmic Surgery, Medical College, Calcutta, is appointed to officiate as Inspector-General of Civil Hospitals, Central Provinces, *vice* Colonel Norman Walker, with effect from the date on which he assumes charge of his duties. He will be appointed permanently to that post, with effect from the 30th March, 1929.

Lieutenant-Colonel C. A. Sprawson, C.I.E., M.D., F.R.C.P., V.H.S., I.M.S., Principal and Professor of Medicine, King George's Medical College, Lucknow, is appointed to be Inspector-General of Civil Hospitals, United Provinces, with effect from the 16th March, 1929.

Lieutenant W. L. Neal, I.M.S., Military Medical Officer at Gyantse, is appointed to officiate as British Trade Agent, Gyantse, and as British Trade Agent, Yatung, in addition to his other duties, with effect from the 1st March, 1929, and until further orders.

LEAVE.

In supersession of the previous notification, Major-General F. H. G. Hutchinson, C.I.E., M.B., K.H.S., I.M.S., Surgeon-General with the Government of Madras, is provisionally granted, preparatory to retirement, leave on average pay for 8 months combined with leave on half average pay for 18 months and 25 days, with effect from the afternoon of the 2nd August, 1928.

Colonel J. Norman Walker, M.R.C.P. (Lond.), I.M.S., Inspector-General of Civil Hospitals, Central Provinces, is granted leave preparatory to retirement for 6 months and 8 days on average pay, with effect from the 21st February, 1929, or the date on which he avails himself of the leave.

Lieutenant-Colonel B. E. M. Newland, I.M.S., Civil Surgeon, Moradabad, leave on average pay for 6 months and 26 days, combined with leave on half average pay for 1 month and 4 days, total 8 months, with effect from 24th February, 1929, or the date of relief.

Lieutenant-Colonel R. S. Townsend, I.M.S., Civil Surgeon, Mussoorie, leave on average pay for 26 days combined with leave on half average pay for 1 month and 17 days, total 2 months and 12 days, with effect from 20th December, 1928, or date of relief.

Lieutenant-Colonel J. F. Boyd, I.M.S., Civil Surgeon, on leave, has been granted by the High Commissioner for India a further extension of 3 months' leave on half average pay on medical certificate, in continuation of the leave sanctioned in Government Notification No. 1098|V—6, dated 26th October, 1928.

Lieutenant-Colonel E. S. Phipson, D.S.O., I.M.S., Health Officer of the Port of Aden, Medical Officer in charge of European General Hospital, and Civil Administrative Medical Officer, Aden, is granted leave for 7 months, with effect from the 1st April, 1929, or the subsequent date of relief.

In modification of Government Notification No. S. 20|10, dated the 28th January, 1929, Lieutenant-Colonel W. M. Houston, I.M.S., Health Officer of the Port of Bombay, is granted leave for 1 year, with effect from the 16th March, 1929, or the subsequent date of relief.

Major W. P. Hogg, D.S.O., I.M.S., an officiating Agency Surgeon, is granted leave on average pay for 3 months under the Fundamental Rules combined with furlough under the Military Rules for 5 months, with effect from the 1st March, 1929.

RETIREMENTS.

Lieutenant-Colonel F. W. Gee, C.I.E., M.B., I.M.S. (retd.), 18th August, 1928.

Lieutenant-Colonel W. R. Battye, D.S.O., I.M.S., with effect from the 20th January, 1929.

Lieutenant-Colonel A. W. Greig, I.M.S., with effect from the 29th January, 1929.

PROMOTIONS.

Major to be Lieutenant-Colonel.

Mozaffer Din Ahmed Kureishi. Dated 4th March, 1929.

Captains to be Majors.

B. Basu, F.R.C.S.E. Dated 5th February, 1929.
M. A. Jafarey. Dated 25th February, 1929.
G. Verghese, M.B. Dated 27th February, 1929.
A. D. Loganadan. Dated 27th February, 1929.
S. N. Mokand, M.B. Dated 1st March, 1929.

HONOURS.

His Excellency the Grand Master of the Most Eminent Order of the Indian Empire is pleased to announce that His Imperial Majesty the King, Emperor of India, has been graciously pleased to make the following promotions in, and appointments to, the said order:—

To be Companions.

Lieutenant-Colonel C. I. Brierley, I.M.S.
Lieutenant-Colonel R. E. Wright, I.M.S.
Lieutenant-Colonel H. H. Broome, I.M.S.

His Imperial Majesty the King, Emperor of India, has been graciously pleased to give orders for the following promotions in, and appointments to, the Most Excellent Order of the British Empire:—

To be Commanders.

Civil Division.

Lieutenant-Colonel J. K. S. Fleming, O.B.E., I.M.S.

NOTES.

CROOKES' LABORATORIES.

WE are glad to report that Messrs. Crookes' Laboratories have recently opened up a branch depôt in this country. The "Collosal" and other products of this firm are well known, and are of truly colloidal character, whereas many "colloidal" products on the market are merely crude suspensions. The agent for India is Mr. J. L. Holden, M.P.S., c|o British Colloids, Ltd., The Crookes' Laboratories, 10, Graham Road, Ballard Estate, Bombay.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LANTERN SLIDES FOR PUBLIC HEALTH PROPAGANDA.

THE Calcutta Pure Drug Co., 4-1, Waterloo Street, Calcutta, have recently forwarded to us a copy of their revised catalogue of lantern slides for public health propaganda purposes. These slides are in sets, and will be of considerable interest to public health workers in this country. They include key-lectures with the following numbers of slides for each subject: malaria (24); kala-azar (19); cholera (22); small-pox (15); tuberculosis (28); leprosy (30); plague (36); beriberi (12); malaria fever and its causes (39); ankylostomiasis (sets of 12 and 28 slides respectively); school sanitation (12); venereal diseases (30); maternity and child-welfare (36); first aid (34); physical culture (39); and sets on temperance, agriculture and the dairy, natural science, and industries.

The prices are: for uncoloured slides Rs. 9 per dozen; for hand-coloured slides Rs. 12 per dozen. The same firm also stock lanterns and accessories.

LIVER EXTRACT B.D.H.

THE treatment of pernicious (and other forms of) anæmia, and of sprue with liver extract dates from the cardinal work of Minot and Murphy in 1927. The following is an abstract of their chief paper (*British Med. Journ.*, 10th March, 1928), in which the treatment was tested on 34 patients, of whom 32 responded favourably to it.

The clinical trials made in various hospitals upon samples of liver extract distributed by The Medical Research Council were reported upon briefly in the *British Medical Journal* and *The Lancet* of March 10th, 1928. In these trials the extract was gauged by the rate of increase of the young red cells (reticulocytes). In practice it was found that simultaneously with this increase there was a distinct feeling of general improvement in the patient, and this was followed by a progressive increase in the count of red blood corpuscles.

Of the thirty-four cases treated, thirty-two responded to the treatment, but nine of these were ruled out owing to complications such as a possibility of natural remissions and the influence of some previous treatment.

In twenty-three cases the improvement could be attributed with certainty to one cause only—the administration of the liver extract.

The daily dose given was the equivalent of half a pound of fresh liver. The rise in the percentage of reticulocytes reached a maximum in 12 to 15 days, whilst the count of the red blood corpuscles rose from 750,000 at the beginning of the treatment to 5,000,000 after 34 days' treatment.

Larger doses induced a quicker response, but the "half pound" daily dose is recommended as the most satisfactory.

In addition to the work carried out by The Medical Research Council clinical experiments have been made in this country with whole liver and with liver extract by Fraser and others. These workers reported their results in the *British Medical Journal* of February 7th, 1928, summarising them as follows:—

"Nineteen patients with pernicious anæmia have been treated with whole liver or a liver extract. Nine of them were in the first attack or in a relapse, and seven of these showed a prompt response to treatment, with a temporary rise in the percentage of reticulated red cells in the circulating blood, and a steady increase in the total red cells and the hæmoglobin. The reason for the failure of the treatment in the other two patients is not clear.

Ten patients commenced treatment during the remission stage or received other forms of treatment in addition, so that observations on the immediate effects of the treatment were not possible. The condition of these patients at the end of varying periods of treatment (up to six months) affords confirmatory evidence of the value of this treatment."

Further, the clinical evidence furnished by Minot and Murphy in their more recent experiments with a non-protein liver extract prepared by the method of Cohn confirms the evidence produced in this country that liver extract, when properly prepared, is just as efficacious as whole liver.

Thus Liver Extract B.D.H., made in accordance with the method tested by The Medical Research Council, produces results in pernicious anæmia as beneficial as those obtained with a diet of whole liver.

Method of Administration.

The advantages of Liver Extract B.D.H. over whole liver—raw or cooked—lie in its simplicity in use and in its palatability.

Liver Extract B.D.H. is prepared with hot water in an exactly similar manner to that adopted with an ordinary meat extract; that is to say, the whole of the contents of one tube—the active principle of half a pound of fresh raw liver—is emptied into a cup or other similar vessel. The cup is then filled with hot water, the mixture being stirred during the process of adding the water.

Condiments should be added to suit the individual palate, and the mixture taken as an ordinary soup or beef tea. In this way it is quite palatable.

In pointing out the advantages as to palatability and simplification of treatment in using the extract, Cohn and other workers emphasise the necessity of prescribing an adequate and well-balanced diet throughout the course of the treatment.

The chief drawbacks of the liver treatment in India are: (*a*) that the dose amounts to half a pound of fresh liver a day; (*b*) that the Indian butcher often supplies cat or other liver in place of sheep's; and (*c*) that vegetarian patients will not take the liver if they know it to be such.

The last class, however, can usually be persuaded to take a "medicine" in place of liver extract. And in this connection the powdered extract of liver prepared by the British Drug Houses, Ltd., is of interest. This product has been approved of by the Medical Research Council of Great Britain, and is very simple in use; the contents of one tube are mixed with hot water in a cup as in making Bovril or other meat extract.

Supplies can be obtained from the Indian agents: H. S. Clark & Co., 8|10, Waterloo Street, Calcutta; and Byram Mistry, 119, Parsee Bazaar Street, Fort No. 1, Bombay.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c|o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India. Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

DANGEROUS BLOOD DONORS.

By R. B. LLOYD, M.A., M.B., B.Ch. (Camb.),
LIEUTENANT-COLONEL, I.M.S.,
Imperial Serologist,
and
S. N. CHANDRA, M.B.,
Officiating Assistant Serologist.

(Results expressed in the Moss terminology.)

THE object of this short note is to describe the iso-agglutination reactions of three very abnormal cases recently examined. We also report two instances of abnormally high iso-agglutinin titre in group IV donors.

(1) *Abnormal reactions.*

Case 1.—Patient R., diagnosis corneal ulcer, no other disease. Wassermann reaction negative. There was no question of a blood transfusion in this case. His abnormal blood group was discovered during an examination of his blood from a research point of view. His cells, tested for iso-agglutination against sera of known groups, yielded the following results:—

With group IV serum —
With group II serum +
With group III serum —

These reactions correspond to no known group. This person's serum tested against cells of known groups showed the following reactions:—

With cells I +
With cells II +
With cells III +

His group therefore appears to be IV.

On the supposition that his correct group was IV, in which case group II serum should yield a negative result in the first experiment, the cells of R were tested against four other known group II sera. These yielded a negative reaction in each case. Had the particular group II serum first employed for grouping not been used, this individual R would have been passed as a perfectly normal instance of group IV.

There is therefore some abnormality either in the cells of R or in the agglutinins of the particular group II serum first used. To investigate this further, absorption tests were carried out. The serum of this particular group II person, denoted X group II, was absorbed with the cells of R, and afterwards tested for iso-agglutination as under:—

Serum of X group II (absorbed with cells R) and cells R — (absorption complete).
do. and cells I +
do. and cells II —
do. and cells III +

This X group II serum unabsorbed had been very frequently tested against known group IV cells yielding in every case a negative result.

It is therefore possible that the serum of X group II possesses some abnormal agglutinative power, and that R was a perfectly normal group IV person, or that R was in some way abnormal as regards agglutinogens. The latter is the more likely.

The practical outcome is that R should not be used as a universal donor, for the recipient might be of group II, in which case a dangerous reaction might occur.

Case 2.—Patient P, diagnosis advanced spleno-medullary leukæmia.

The cells of P tested for iso-agglutination reacted as under:—

With group IV serum —
With group II serum —
With group III serum —

Therefore, as judged from his cell reactions, his group is IV. Similarly:—

Serum of P with cells II +
do. with cells III +
do. with cells I +

Therefore, as judged from his serum, his group is IV.

So far he appears to be an entirely normal instance of group IV. The proposed donor was S, wife of the recipient. Her reactions were as under:—

Cells of S with serum IV —
do. with serum II —
do. with serum III —

Therefore, as judged from her cell reactions, her group is IV. Similarly for her serum reactions:—

Serum of S with cells I +
do. with cells II +
do. with cells III +

Therefore, as judged from her serum, her group is IV.

These two persons being thus both of group IV ought to be entirely compatible, but cross-agglutination tests carried out doubly, i.e., serum of P against cells of S, and serum of S against cells of P gave in both cases a strongly positive agglutination reaction. This is a very unusual type of abnormality. Fortunately, abnormal group IV persons are rare. Both the serum of P and the cells of P were perfectly compatible with the cells and serum, respectively, of four other group IV donors. On the other hand, both the serum and cells of P again displayed the same abnormality against one other healthy group IV donor. No further examination was possible in this case, but the conclusion would appear to be that the blood of P is abnormal. This is quite frequently the case in blood diseases, such as leukæmia from which this patient suffered. This case again illustrates the extreme danger of the use of a group IV universal donor,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

employed without a cross test, in the transfusion of persons suffering from blood diseases.

Case 3.—Mr. G., a case of neuritis caused by electric discharge, offered himself as a blood donor.

The reactions of his cells were as under:—

Cells G with group IV serum + (weak):
Cells G with group II serum + (weak):
Cells G with group III serum —

Thus from his cell reactions Mr. G. appears to belong to group III. His serum reactions were as under:—

Serum G with cells III + (abnormal).
Serum G with cells I +
Serum G with cells II +

Therefore this person is of abnormal group. His serum behaves as group IV, while his cells behave as group III. As the two positive reactions with his cells were weak, it would seem that Mr. G. was really of group IV, and that there was some abnormality in his cells, which was demonstrated by a weak positive reaction with group II serum and which was necessarily shown by group IV serum also. This is another instance of an abnormal group IV person whom it would not be safe to utilise as a universal donor.

(2) *Instances of abnormally high iso-agglutinin titre in group IV donors.*

Patient T who required a transfusion was grouped and found to be of group II. The only donor available (S. S. G.) was found to be of group IV. This donor might at first sight appear suitable, but direct matching tests showed very strong agglutination between the donor's serum and the recipient's cells. There is necessarily some agglutination in this case, but it was considered to be excessive. The test was accordingly repeated after dilution of the donor's serum to 1 in 10. The agglutination was still very strong. As 1 in 10 is the dilution which the donor's blood ordinarily undergoes during a transfusion this donor was regarded as unsafe.

In another instance of this kind the patient J was of group II. Two donors were available, one of whom was group III (incompatible). The other was H. N. G. who was of group IV, but who was not passed as a safe donor on account of high iso-agglutinin titre detected by cross matching after dilution of the donor's serum.

This brief note is intended to bring out the fact that danger from the use of group IV universal donors may arise in two ways:—(*a*) abnormal reactions of the recipient caused by disease, and (*b*) unusually high iso-agglutinin titre in the group IV donor used. The employment of universal donors, without a cross test, should accordingly be limited absolutely to blood transfusions necessitated by surgical emergencies in otherwise healthy persons. The use of group IV universal donors without cross tests for the transfusion of medical cases involves serious risk.

The results in this paper have been expressed in terms of the terminology of Moss, as readers in India are not as yet accustomed to the use of the International Nomenclature.

ENCEPHALITIS LETHARGICA—A BRIEF DESCRIPTION OF THE DISEASE, WITH SHORT NOTES ON THE POST-ENCEPHALITIC LETHARGIC CASES TREATED AT THE RANCHI INDIAN MENTAL HOSPITAL.

By J. E. DHUNJIBHOY,

MAJOR, I.M.S.,

Superintendent, Ranchi Indian Mental Hospital.

CASES resembling epidemic encephalitis or encephalitis lethargica were first reported in India by the military medical authorities at Karachi as early as 1919. On this report, the D.M.S. in India issued a circular letter No. 7T, dated the 27th February, 1920, to all military medical officers in India giving a brief description of the disease with a view to enabling them to detect and treat the cases as early as possible.

Many medical men in charge of large general hospitals and mental hospitals in India also, as well as private practitioners of repute from time to time have observed cases of post-encephalitis lethargica, especially of Parkinsonian type.

The first few cases of this disease seen by me in England were at the Bethlem Royal Hospital in 1923. In 1924 at the Berhampore Mental Hospital in Bengal I saw two suspected cases of this disease, but in the absence of any detailed history from the patients' friends and relations I could not diagnose them as such. Since then I have seen a few undoubted cases of post-encephalitis lethargica of different types at the Ranchi Indian Mental Hospital, as well as in my private practice.

On the 11th June, 1928, I read a paper entitled "Encephalitis lethargica with special stress on its psychological complications" before the Ranchi Medical Society with a clinical demonstration of different types of cases.

All post-encephalitis lethargica types of cases now seen in India, especially among persons who have never gone out of India, prove beyond doubt the prevalence of encephalitis lethargica at some time or another in sporadic form in India.

Moreover, the fact that encephalitis lethargica has been an increasingly important cause of insanity in the West, and that during the past few years this disease has been seen more and more in the new admissions of patients to mental hospitals, and similarly a few such cases having also been detected at the Ranchi Indian Mental Hospital, seems to me a justification for giving a rather more detailed description of the disease than it might appear to deserve. In my description of the disease I have mainly confined myself to the psychological complications as they cover my sphere of work and experience.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

History.—Epidemic encephalitis or encephalitis lethargica is now considered to be an acute contagious disease, the virus of which attacks the central nervous system and for the most part its grey matter. It made its first appearance in 1917 in which year Von Economo of Vienna published a description of it and named it "encephalitis lethargica." It began to appear all over Europe in epidemic form in 1917. It was so widely spread in epidemic form that this led to its description and recognition as a definite disease entity. At the present time the physical and mental changes due to the lesions which it causes in the central nervous system are giving rise to great anxieties from the medico-legal as well as from the medical aspect. Though the disease was first introduced in the West in epidemic form, most of the cases on the continent and in England which the physicians now encounter are sporadic.

Mode of Infection.—Although histological findings suggest an invasion by some micro-organism, none has so far been demonstrated. The disease is contagious and appears to be spread by carriers who are resistant to it, infecting those who are not resistant. Instances in which direct infection can be traced from one case to another have occurred, but are rare. Recently in the Whittingham County Mental Hospital a small outbreak of encephalitis lethargica occurred affecting 6 patients, admitted some considerable time previously to the hospital and limited to two adjoining wards. The virus of encephalitis lethargica, besides being found in the brain and cerebro-spinal fluid, is also found in the saliva and naso-pharyngeal secretion, and it seems probable from experience that the route of infection is through the naso-pharyngeal mucous membrane.*

Incubation Period.—This has not yet been definitely determined, though some authorities regard it as from 10 to 24 days.

AGE, SEX AND OCCUPATION INCIDENCE.

Individuals of every rank of life and occupation and of both sexes are equally liable to infection. It affects persons of all ages from infancy onwards, but it is found to be most common between the ages of 2 and 30. Further, the mental after-effects appear to be more marked and very frequent in the younger patients.

Mortality Rate.—It is at present impossible to fix the mortality rate with any degree of accuracy owing to the disease being so often unrecognised. However, some authorities put this down to 18 to 20 per cent.

*The virus of encephalitis lethargica is usually supposed to be a filtrable one. Doerr and Zdansky, Levaditi, Nicolau and Schoen, and Cowdry and Nicholson have observed organisms described as *Encephalitozoon cuniculi* in the brains of rabbits and mice suffering from a similar, or identical, disease. This work, however, still lacks confirmation.— EDITOR, I. M. G.

Pathology.—This may be divided into four headings.

(1) *Macroscopical.*—The body is generally emaciated and lacking in fat. The intracranial membranes are perfectly normal, and the dura and pia mater show no inflammatory reaction. The pia mater strips readily from the surface of the cortex, the colour of which is a dull buff instead of the usual glistening whitish grey. On section slight congestion of the brain substance may be apparent as shown by small bleeding points, generally in the grey matter. These changes are likely to be observed in the parts about the Sylvian aqueduct, the fourth ventricle and the basal ganglia.

(2) *Microscopical.*—The most marked microscopical change is the perivascular round celled infiltration which occurs, especially round the small vessels. Every kind of cell degeneration seems to have been noted in all parts of grey matter, but the cells principally affected are the ganglion cells. Changes have been observed throughout the grey and white matter of the central nervous system and also in the peripheral nerves. Some minute bodies have also been found by different observers within, and outside the nerve cells, but the meaning of these is not yet determined. Another point of interest about these changes in the brain is that they are found to be of different stages, showing that the disease is apparently a progressive one, and that the virus—like that of syphilis—remains active for long periods even if quiescent, producing fresh inflammatory lesions from time to time. It has now been definitely established that post-encephalitic Parkinsonism is due to the destruction of the cells of the substantia nigra and this has been definitely proved on post-mortem examinations.

(3) *Bacteriological.*—Much experiment has been carried out on this disease. Inoculation into rabbits and monkeys often produces typical symptoms of the disease. To sum up our knowledge gained on the subject, one may say that encephalitis lethargica is an infectious disease and is due to an invisible filtrable virus. This keeps virulent for long periods in water and milk and it can be destroyed by carbolic acid. The virus has been found in the brain, cerebro-spinal fluid, saliva and naso-pharyngeal secretion, and experimental work has shown that there are points of similarity between this virus and that of herpes febrilis.

(4) *Biochemical.*—The Wassermann reaction in both the blood and cerebro-spinal fluid is negative, and the cerebro-spinal fluid is clear and colourless and does not escape with increased pressure. The cell count shows no appreciable increase in all the cases. Pandy's and the colloidal gold test reactions as a rule are negative. The sugar content of the cerebro-spinal fluid is slightly increased in encephalitis lethargica, but the chlorides are usually normal. In the blood there is no change except a possible leucocytosis during the febrile stage of the disease.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SYMPTOMATOLOGY.

This disease commonly begins with a febrile illness, and in its milder forms is often mistaken for influenza in the West and possibly malaria and influenza in the East. The temperature runs from 100°F. to 101°F. and apart from headache (sub-occipital) and general malaise and slight stiffness of the neck with a slight lethargy and drowsiness, there is very little general disturbance. In the course of a day or two the nuclei of the third nerve become affected, leading to dimness of vision for near objects, due to paralysis of accommodation; ptosis and weakness of the ciliary muscles are also noted and at this stage complaint is also made of diplopia. The acute attack lasts only a short time and many patients may not be laid up for longer than a week or two. By this time the neuronic disorder will nearly always appear to have cleared up or will be represented by some minor difficulty of co-ordination that gives no definite indication of organic diseases.

The mental symptoms of the early stage of the disease consist of lethargy and delirium.

Lethargy.—In the lethargic type, besides the somnolence, which is so common, the patient when awake is in a state of mental lethargy, a slowness in reaction to mental stimuli of any kind which cannot fail to be noticed. During the waking intervals, the patient is often restless, noisy and excited. Lethargy in this disease often takes the form of inversion of the normal sleep rhythm, that is to say the patient is unable to keep awake or to be kept awake during the day and is unable to sleep during the night. When this occurs the patient is usually restless, noisy and excited at night (*vide* Case 1).

In the *delirious* type, restlessness, mental or physical, or both, takes the place of lethargy or masks it. The mental symptoms tend to abate in time but the lethargy and somnolence very frequently remain for long periods after the acute stage of the disease has passed.

In the more acute form the mental symptoms may be severe, and this form may suggest an acute confusional psychosis. The patient is extremely restless, excited, confused and disorientated. He suffers from vivid hallucinations and in severe attacks he is quite unmanageable and therefore it may be necessary to certify him to get him admitted into a mental hospital.

Sometimes the course of the disease may be extremely prolonged with continued symptoms of general intoxication and the development from time to time of signs of fresh involvement of the nervous system. Such a case may go on for many months and terminate in recovery or death. On the other hand, as stated above, there is a large group of mild or abortive cases in which the symptoms of general infection are present and the cranial and other nerve palsies clear up very rapidly and the patient recovers completely in two or three weeks' time. Since the symptoms in encephalitis lethargica depend almost entirely upon the localisation of the virus, one must be prepared to find almost any combination of signs and symptoms in the course of an attack. Thus with regard to the onset, in addition to the common type already described there may be instances in which meningeal symptoms predominate from the first (*vide* Case 8), and restlessness, irritability or even a noisy delirium may take the place of the more usual lethargy, or the illness may begin actually with an apoplectiform seizure or the picture may be entirely dominated by the presence of muscular twitchings (what is called a myoclonic type). In another group of cases the disease may be ushered by severe neuralgic pain in the peripheral nerves and this may be followed by wasting and weakness of an isolated group of muscles or absence of tendon jerks, and a subjective sensation of numbness in the extremities which may simulate polyneuritis. This account of the symptomatology is by no means exhaustive, for it is extremely varied, and differs in individual cases. In mild cases the signs of involvement of the nervous systems are often fleeting and special enquiries are necessary to elicit the history of transient diplopia and dimness of vision, temporary paralysis of accommodation, pain and stiffness of the back of the neck, and neuralgic pain or muscular twitchings. The extent and duration of pyrexia are also variable. It is high as a rule during the initial stage, but on account of the serious nature of the onset it may have subsided before the case comes under medical observation.

COURSE OF THE DISEASE.

The very acute form is often fatal, especially if the mental excitement is at all severe. In the milder types the patient makes a satisfactory recovery when the fever subsides, except for symptoms of a localised paresis which may show itself in a difficulty of accommodation or may require an exhaustive neurological examination to reveal it. But the greatest importance of the disease lies, however, in its sequelæ which vary in form and which strongly suggest from their capacity of spontaneous variation a progressive and active disease process. The sequelæ may appear after the initial onset at a varying interval from two months to many years, and during this interval the patient as a rule has enjoyed good health and carried on his usual occupation.

The commonest clinical sequelæ of encephalitis lethargica are as follows:—

(1) *The Parkinsonian syndrome in adults.*—This is the most common disability of a general kind resulting from encephalitis lethargica. The early signs of Parkinsonism are found in the upper part of the body and more often in the face than elsewhere. The face is greasy and the expression tends to be fixed, with eyes staring, the mouth often a little open and a trickle of saliva dribbling from it; also the palpebral fissures may be wide or narrow and, when an attempt is made to open or shut the eyes, quivering of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

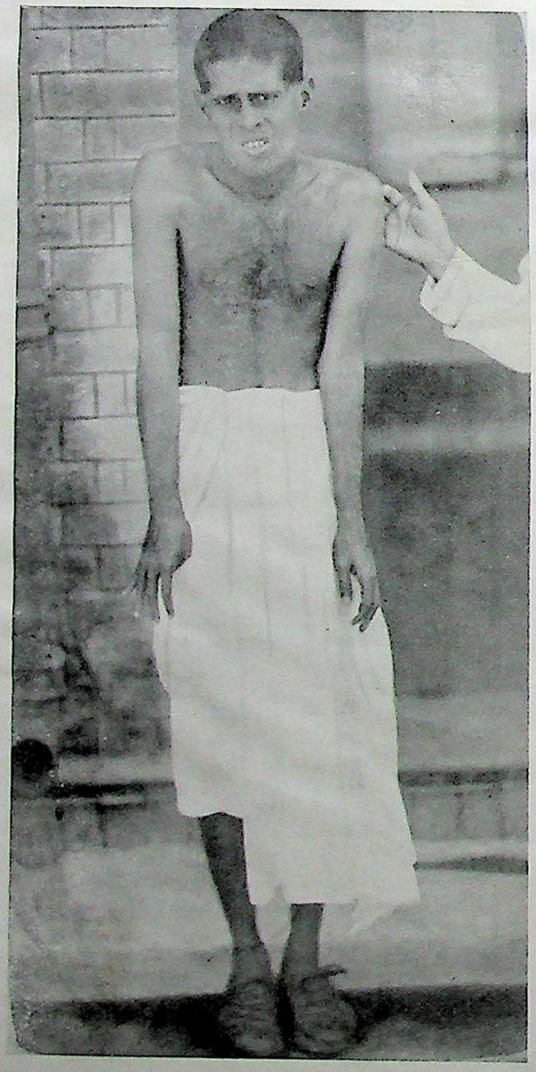
Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

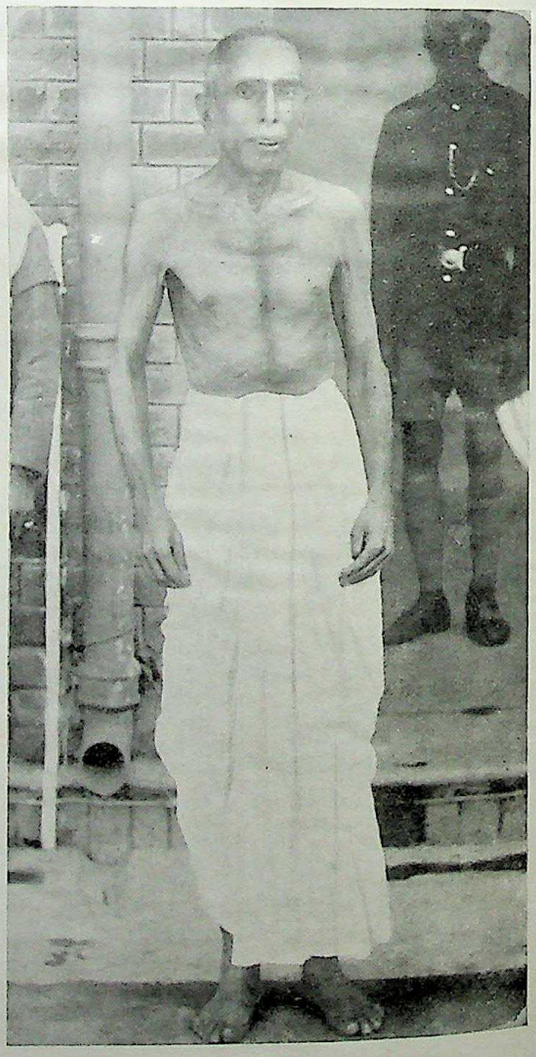
Digitized by Arya Samaj Foundation Chennai and eGangotri

PLATE I.

Photograph A.



Photograph B.



Photograph C.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the lids takes place and lacrimation is also visible. Diplopia, squint, nystagmus are less commonly found than in the acute stage of the disease. But the defects in ocular movements and pupilary reactions are *never absent*. The external ocular palsies are supranuclear in origin and consist of defective conjugate movements, especially on convergence. The pupils are not usually altered in size or shape but are often unequal and almost always show some disturbance of reflex action to light or to accommodation or both. Mistiness of vision from defective nerve balance or ciliary paralysis is often complained of and may be a persistent defect.

The characteristic feature of the Parkinsonian stage is the immobility of the affected parts and its rigidity and the typical Parkinsonian mask, gait, salivation and lacrimation.

ILLUSTRATIVE CASES.

Chronic Encephalitis of Parkinsonian Types.

Case 1. (*Photograph A*).—S. S. D., A Hindu widow, aged 50, was admitted on 19th March, 1927, on the following medical certificate: "A dull stupid looking individuality, morose, habits unclean, face vacant, peculiar stare, gradual progressive weakness of muscles. She has been in this stage for the last six years or so and is gradually getting worse. What she wants must be immediately complied with, otherwise she would make a hell of the whole household by her pitiable cries."

On examination and further observation in the hospital she was diagnosed as a typical case of Parkinsonian type of chronic encephalitis lethargica. She had a fixed gaze, greasy face and mask-like expression. She had a typical stoop with immobility and rigidity of the upper part of the body and the proximal joints. Saliva was dribbling from her open mouth and lacrimation was present. Eyes with fixed gaze and marked quivering of the eyelids on opening and shutting. The right pupil was slightly more dilated than the left. Light and accommodation reflexes were sluggish. No diplopia or nystagmus was present. Had a characteristic monosyllabic slur and slight tremor of the tongue.

Personal history.—To complete the diagnosis her son-in-law was interviewed. He said that in 1920 the patient suffered from a serious illness of febrile type. During this illness she had tremors of the hands and complained of dimness of vision and diplopia. A year after this she exhibited maniacal symptoms with the present Parkinsonian syndrome. She was quite manageable all these years at home but since 1926 became unmanageable as she developed typical disturbance of sleep rhythm, and during the night remained awake and kept the whole household awake by her cries, which gradually led her people to seek admission for her into a mental hospital. No psychopathic or neuropathic history in the family. During her stay in the hospital she suffered from disturbance of sleep rhythm for a month. To further confirm the diagnosis, a few injections of hyoscine hydrobromide were given and a marked temporary improvement took place in her case. Her salivation and lacrimation after a few injections disappeared and some expression began to appear on her face. She began to take more interest in life and attended the amusement hall and gardens. She was then placed on a six months' continuous treatment with hyoscine hydrobromide, but no further improvement was noticed. For the first week 1|100 gr. was given and later 1|50 gr. throughout the remaining period. Once a week pilocarpine nitras 1|10th of a grain was injected to counteract the uncomfortable symptoms of hyoscine. As she did not show any mental symptoms and was quite well-behaved during her stay of nearly two years in the hospital, she was discharged on 27th February, 1929, to the care of her son-in-law, who was very pleased to take her back as she had improved very much. Instructions were given to him to put her immediately on hyoscine injections if she got worse.

Case 2. (*Photograph B*).—S. K. B., a male Hindu student, aged 24, was admitted on 12th November, 1925, on the following medical certificate: "Has a vacant look, stupid appearance, incoherent talk, restlessness, foolish speech and generally depressed."

On admission he was diagnosed as a case of catatonic type of dementia præcox. He was also so diagnosed in the Berhampore Mental Hospital where he had been previously admitted for treatment on 15th December, 1924, and discharged as cured on 29th August, 1925. On further examination and observation, he was diagnosed as a case of Parkinsonian type of chronic encephalitis. He had lacrimation, salivation, fixed gaze, immobility and rigidity of the upper part of the body and proximal joints, and the characteristic gait and mask. Had fine tremors of the hands. The eyes showed marked quivering, pupils unequal, light and accommodation reflexes sluggish. To complete the diagnosis, his guardians were written to. They informed us that the patient had suffered from an acute attack of fever in 1922, he recovered from this illness and 18 months later developed maniacal symptoms for which he was sent to the Berhampore Mental Hospital on 15th December, 1924. On his discharge from the mental hospital on 29th August, 1925, he was quite well mentally, but was reported to be highly lethargic and did nothing but sat at home and gazed at the inmates of the house. On 12th November, 1925, he again developed maniacal symptoms for which he was sent here for treatment. The history shows that he had the first acute attack in 1922 but recovered and the Parkinsonian syndrome developed in 1924. He is still highly lethargic, though on hyoscine treatment for six months a little improvement took place in his condition. His salivation and lacrimation disappeared, and a little expression returned to his face. He began to take a little interest in his life but he did not improve beyond this. He occasionally tries to run away from the wards.

Case 3. (*Photograph C*).—M. K., a male Mahommedan cultivator, aged 50, was admitted on 10th September, 1927, on the following medical certificate: "Listless, depressed, slurred speech, mutters to himself, apathetic, attacks other people." On admission he was diagnosed as a Parkinsonian case with typical mask, gait, immobility and rigidity of the affected parts and salivation and lacrimation.

Eyes quivering, sluggish reflexes to both light and accommodation, pupils equal, defective conjugate movements, especially on convergence, and had tremor of lower jaw and "trombone" (antero-posterior) movements of the tongue. Speech, typical monosyllabic slur of the Parkinsonian. As he was picked up from the road by the police nothing is known about his previous history. But this was a typical case of Parkinsonian syndrome and the tremor of the jaw which is the only tremor of its kind lends further support to the diagnosis. The diagnosis was further confirmed by hyoscine treatment. He showed slight improvement on hyoscine therapy. The salivation and lacrimation disappeared, a little expression returned to his face and the tremor of the jaw much improved. He did not show any further improvement than this.

Case 4.—R. D., a Hindu woman, aged 30, was admitted on 19th August, 1926, on the following medical certificate: "Morose, apathetic to her surroundings, attitudinistic, negativistic, refuses to eat, does not wear clothes." On admission she was diagnosed as a case of catatonic type of dementia præcox. On further observation and examination she was found to be suffering from the Parkinsonian syndrome with typical gait, mask-like face, lacrimation, salivation, rigidity and immobility of the affected parts. She never spoke a word after her admission and refused to eat any food and was occasionally nasal-fed and throughout spoon-fed. The eyes showed no marked quivering, pupils unequal, light reflex normal, but that to accommodation sluggish. She was reported by the police to be a woman of easy virtue

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and had no relation from whom we can obtain her previous history. On the clinical diagnosis of the case she was treated with hyoscine hydrobromide and to our great surprise we found a great improvement in her case. After a month of hyoscine treatment she began to talk, bathe and feed herself, and attended the amusement hall where she sang and danced. Her salivation and lacrimation disappeared and complete expression returned to her face. Her treatment was continued for six months and a marvellous improvement took place. Hyoscine has been stopped in her case since then, but no untoward symptoms have yet appeared and she has maintained her improvement. She behaves quite normally now. This case has responded remarkably to hyoscine treatment.

Case 5.—In December 1927 I was consulted in the case of S. J., a Parsee girl student, aged 19, in Bombay. On examination she was found to be a typical case of the Parkinsonian type of post-encephalitis. Her parents gave the history that in 1923 she became completely lethargic and refused to do any work and was even spoon-fed. Before that she was a very social, intelligent and hard-working student. It was further said that the girl had suffered from a serious febrile illness on 8th January, 1922, which was clinically diagnosed as paratyphoid fever. She recovered from this after a month or two and was sent for a change as she was found very weak in health. She suffered from dimness of vision after her illness and had to consult an ophthalmic surgeon who prescribed glasses. On her return from up-country she again attended the school and was quite normal for some time but later was inclined to be lazy and then became completely lethargic and the typical Parkinsonian syndrome developed about a year after her illness. She was treated for hysteria for nearly four years, during which period I was told that she was completely changed physically. An old photograph of her was shown to me which definitely corroborated the statement. She was placed on hyoscine treatment and it proved very successful. She became active and began to take an interest in her life and after six months' treatment she became quite normal. As she is still very weak she is not attending the school but studies at home and is not a source of extreme worry and trouble to her people. During my last visit to Bombay in 1928 I saw the patient again and she has still maintained the improvement since 1927.

CHRONIC ENCEPHALITIS. SECOND TYPE. WITH INVOLUNTARY MOVEMENTS.

Involuntary movements of many kinds are amongst the commonest manifestations of chronic encephalitis lethargica. More than one variety may be seen in the same patient and they may change during the course of the illness. Some are slight and almost insignificant, others are large and arresting and in a severe case the body may be in an almost convulsive riot of movements. (*vide* Case 6). Involuntary movements have, however, rarely occurred as the sole manifestation of the disease. Mental or physical derangements of some sort are always present. They may be so slight as to be easily missed by the casual observer. Emotional instability and restlessness, especially at night, changes in behaviour and oculo-motor defects are perhaps the most frequent slighter accompaniments of involuntary movements.

The involuntary movements of encephalitis lethargica are grouped as follows:—

(1) *Choreic form.* In this the movements resemble those of chorea (*vide* Case 7).

(2) *Myoclonic movements.* These are well marked in the acute phase of the disease, but they appear as late manifestations in any part of the body and proceed for months, accompanied by pain. The pain is often severe and continuous and may last long after the shock-like muscular contractions have disappeared. The contractions are rhythmical at a rate which varies and may go up to 40 a minute, involving part of a muscle, a whole muscle, or a muscle group. Sometimes the upper abdominal wall or the diaphragm is the part most affected and in the latter case the objective manifestation is recurring hiccup.

Second type—Cases with Involuntary movements.

Case 6.—K. N., a Mahommedan male labourer, aged 23, was admitted on 29th March, 1927, on the following medical certificate: "Dull, stupid, does not answer all questions, noisy, abusive, indecent and has some ataxy of the lower limbs." On admission he was found to be excited, but after a month he became quite normal and began to answer all questions coherently. His speech was slow but distinct, comprehension good. He was found to be suffering from involuntary tremor of the upper and lower extremities, more marked in the legs. The tremors on the left side of the body were more marked than of the right. His tremors were such that it appeared that his whole body was almost in a convulsion of movements. The tremors increased when the patient got excited or a little flurried, and decreased when resting in bed. Habits clean. He was slightly emotional, due to the physical defect of which he was quite aware. The eyes showed marked quivering, pupils unequal, light reflex normal, accommodation sluggish, conjugate movements of the eyeballs defective. The patient later became quite intelligent and gave a clear history of the first attack. He said that he was seriously ill about eight years ago with a febrile illness for which he was treated by a village doctor. He recovered from this serious illness which lasted for over four months. He further said that during his illness he suffered from tremors, diplopia and dimness of vision and he still suffers from defective eye-sight. On recovery from this serious illness he continued to work as a labourer but later on suddenly felt no inclination for work and about two years after his illness the present condition of tremors appeared which deprived him of his livelihood, and he lived by begging, for the last four years. He said that in the year 1927 he was practically starving as he had no money and it is natural that he developed exhaustion psychosis. Within a month of his admission to hospital his mental symptoms disappeared owing to good food and good hygienic conditions and during his stay of 19 months in the hospital he never showed any mental symptoms, except that at times he was highly emotional on account of his physical disability. He was placed on hyoscine therapy and a marked improvement took place in his tremors. He slept well and his tremors improved so much on hyoscine that he thought that he would go out and earn his living again by some light work. He was discharged on 5th October, 1928, with the advice to continue the hyoscine treatment in case the tremors increased again. This case also responded admirably to six months' hyoscine treatment.

Case 7.—T. P., a Mahommedan cultivator, aged 22, was admitted on the 15th July, 1927, on the following medical certificate: "Goes about naked, restless, noisy, dirty in his habits."

On admission, he was irrelevant, incoherent, and excited; after about a month he was quite normal except that he was a little restless and used often to run away from the wards. Occasionally he used to shout at night (disturbance of sleep rhythm). He had marked choreiform movements of the right upper and lower extremities and face.

The eyes showed marked quivering, the right pupil more dilated than the left. Reflexes to both light and accommodation were sluggish. He complained of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

dimness of vision in the right eye. Later he improved very much and gave the history that he had suffered from serious febrile illness for three months about four years before, and since then he developed these tremors. In his descriptive roll by the police it was stated that he had had a similar mental attack at home some few years before, so the present attack was a relapse, showing that the disease is still active in him. He was also placed on hyoscine therapy and in his case also it worked wonders. His tremors improved so much on hyoscine treatment that he begged for his discharge and as his mental condition was much improved he was discharged on the 30th July, 1928..

A letter was also given to him to continue the treatment outside in case his tremors become worse again.

Tremors.—Tremors of different parts of the body also occur. In addition to affecting the limbs they are found elsewhere, giving rise for example to shaking of the head to and fro, movements of the tongue, and rhythmical sucking of the lips. All involuntary movements are aggravated by emotional disturbance and fatigue, and disappear during sleep. This was particularly noted in all my patients with involuntary movements.

Respiratory disease type.—The following three chief respiratory types of disorder have been observed:—(1) disorder of respiratory rate, (2) disorder of rhythm, and (3) respiratory tics.

With some of the more severe respiratory cases delusions and violence may develop, necessitating the patient's removal to a mental hospital.

(1) *In disorders of respiratory rates.*—Tachypnœa and bradypnœa are usually paroxysmal. These vary in duration from a few months to several hours. In tachypnœa the rate may be 60 to 100 a minute, and the breathing is shallow. It may be followed by a period of either bradypnœa or apnœa. In bradypnœa the respiratory rate may fall as low as 6 per minute and the breathing is deep and often noisy and panting.

(2) *The disorder of rhythm* includes such abnormalities as sighing and breath-holding. Breath-holding is a most dramatic performance which may be often repeated, especially towards the evening and occur during sleep. After a few deep breaths the chest is held in full inspiration for as long as half a minute.

(3) *Respiratory tic,* such as hiccup, yawning, hard cough without expectoration, sniffling, sneezing are all classed under this heading. These cases are most often met with in young people of school age, who in addition show a change in character and are subject to nocturnal excitement. I have not yet seen a case of respiratory disorder type of encephalitis lethargica in India.

MENTAL SYMPTOMS IN LATER STAGES.

Between the appearance of these later symptoms and the early stage of the disease there is frequently an interval during which the patient is moderately well, and this interval may be quite long—three or more years.

Dementia præcox is often simulated in the frequent cases of mild Parkinsonism with catatonia. Also manic depressive psychosis and paranoia are simulated. Mental changes of every kind have been reported, and changes in the emotional make-up are very common, probably from lesions in the thalamus and basal ganglion. But the most striking mental changes which occur, especially in children and young people, are the sudden and complete alterations of character and temperament now known as the "apache" type. These changes are not at all rare, and manifest themselves either suddenly or insidiously at varying intervals after the onset of the disease. The patient, who before the illness, was hard working, full of interest, good tempered and happy, becomes idle, mischievous, lacking in interest, irritable, impulsive, malicious and a source of grave anxiety to parents and guardians. The complete change in morality is often dramatic in its suddenness. Lying, thieving and sexual immorality, and even inclination to homicidal acts appear in young people of the most respectable and respected families whose upbringing and education have been of the best, and in whose family history generally no psychopathic or neuropathic tendency can be discovered and whose previous moral character and disposition were good. There is generally, though not always, found some change on the intellectual side as well. Cases showing such changes in the character are attending the out-patient departments of all the hospitals in the West in increasing numbers, and a few of them are also now detected at the Ranchi Indian Mental Hospital (*vide* Cases 8 to 12). Children or young men who had hitherto being good tempered, trustworthy, and a help in the home are now untruthful, dishonest, have lost all regard for right or wrong, are irritable, have attacked people with a knife or other weapon, and cannot be left without constant supervision. When seen, these children or young men may be found to be intelligent, with nothing to indicate any such accusation and nothing on which to base any certificate of mental deficiency or insanity. The domestic disturbance caused by these patients is often enough to reduce the peaceful household to a state of chaos. These patients present a problem both to their parents and to the State, and are now potential recruits to the criminal population of mental hospitals. I wonder whether some day such a past attack of encephalitis lethargica will be urged as a defence on a criminal charge.

The term "apache" has now been used universally in the description of cases of post-encephalitis lethargica whose chief characteristics are delinquency and bad conduct, and the apache syndrome is here meant to include all behaviour irregularities from mischievousness to serious crime, such as murder. The condition appears to depend partly on a heightened irritability and diminished power of control, and partly on a lack of reasoned judgment and self-criticism. In

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

any case, the result is a more or less complete disintegration of those psychological sentiments which contribute to the social and moral senses. Motor restlessness is a striking feature in these patients and may be responsible for the numerous cases of "wandering" as well as for their pugnacity.

Apache type—Or cases with changed conduct and temper.

Case 8.—S. K. M., a Bengali Brahmin student, aged 18, was admitted on 2nd August, 1927, as a criminal patient charged with theft on the following medical certificate: "He goes into fits of temper and shows symptoms of excitement and is very violent to others. He takes away all his clothes and goes about naked: he has a violent temper."

On admission his speech was irrelevant, he was quarrelsome, excited, orientation in time and space was good, and slightly delusional. After about a month his speech was relevant but he showed a most quarrelsome temperament. He simply could not get on with the staff and other patients. Later he became very abusive and was kept in a separate room for some time under the strictest institutional discipline. This had the desired effect on him and he improved a little, but he went on telling lies and began to steal other patients' properties. He showed aimless activity with occasional irritability and quarrelsomeness. Occasionally he showed outbursts of acute excitement which lasted for three or four days. He was reported to have attempted suicide at home and also ran away from home many times. In the hospital he also tried to run away and threatened to commit suicide.

Eyes.—The patient complained of dimness of vision and said that he had suffered from diplopia and dimness of vision ever since his last illness, and that he had had to go to an eye specialist for glasses. He had marked quivering of the eyelids. His right pupil was more dilated than the left. Accommodation reflex sluggish, light reflex normal. He had also fine tremors of the hands. He had definite conjugate movements on convergence.

Previous history.—The patient had a severe attack of meningitis and he recovered from this illness after four months. A few months after his illness he became abnormal in his conduct and temperament. He jumped into the Ganges with a view to committing suicide but swam across to the other bank when he saw people attempting to rescue him. He often ran away from the house. Before the illness he was reported to be of good conduct and behaviour; he passed his matriculation examination in the first division. This history was given to me by his father who is also an educated man and was agreed to by the patient himself, and further corroborated by the descriptive roll from the police. His was a typical case of post-encephalitic "apache" type. In his case meningitis was simulated. He was attacked with the so-called meningitis in 1923, and a few months later he began to show abnormal changes of conduct and temperament. He was kept at home all these years, but he committed so many petty offences such as pulling the alarm chain of a train while in motion, travelling without a ticket, going round in taxis and gharries without payment of hire, assaulting people on the slightest provocation, committing petty thefts of articles from friends and relatives, that his people got tired of his sudden change of character, and took protection from the police and had him admitted to the Mental Hospital. The typical symptoms of apache encephalitis were markedly present in his case, such as lying, thieving, quarrelling, wandering, threatening to commit suicide, aggressiveness and in spite of this his intelligence was quite good and his degree of intelligence was always higher than that of his conduct.

Treatment.—Hyoscine has no effect on such cases, but under strictest institutional discipline some cases improve, and he showed much improvement later and was discharged on 28th February, 1929, to the care of his father who was quite pleased to take him home as he found much improvement in him. In such cases the prognosis is a great problem.

Case 9.—J. N. B., a Hindu Brahmin student, aged 20, was admitted on the following medical certificate: "Talks nonsense, violent at times, abuses, suffers from insomnia, refuses food, remains naked." On admission he was found to be quiet, answered all questions coherently and admitted his abnormal conduct and had an insight into his disease. From the date of his admission on 24th December, 1927, to the date of his discharge on 10th June, 1928, he showed no symptoms of excitement but he was extremely quarrelsome, abusive, and a liar.

Eyes.—Slight quivering, defective conjugate movements on convergence, right pupil more dilated than the left. Complained of dimness of vision and wanted glasses for his eyes. Very fine tremors of fingers of both the hands were noticed.

Previous history.—His father informed me that in 1923 the patient suffered from a severe attack of influenza. A month after the illness he showed slight mental excitement with tremors of the hands. He was treated by a homœopath and was quite cured of his illness. After his recovery he again joined the school and passed his matriculation in the first division and then joined the college for his I.Sc. examination. Two and half years after the previous illness he began showing symptoms of lethargy. He shirked his work and refused to go to college, and he was found to be abnormal in his conduct and temper. No psychopathic and neuropathic history in the family. Several times he jumped into a tank adjoining his house but always came up on being entreated by his relatives. He often ran away from his house; he bit the ear of one of his relatives on the slightest provocation. He once very nearly choked his mother. He stopped the Bombay Mail by pulling the alarm cord for which he was sentenced to confinement till the rising of the Court. In 1927 he again pulled the alarm cord of the train at Midnapore and the Sub-divisional Officer of that place released him on the surety of his father. He had often travelled without tickets in buses, trams and trains. He had committed petty thefts from his friends and relatives. He was reported to be very clever, social and a well-behaved boy before the serious illness—so-called influenza—in 1923. The supposed illness was nothing else than the first attack of encephalitis lethargica which resulted in a post-encephalitic character of apache type later. His was a case of ungovernable naughty child throughout. As he showed no mental symptoms during his stay in this hospital and improved in his habits under institutional discipline, he was discharged in care of his father who was willing to take him back as he found him much improved. This case also showed typical symptoms of apache character, namely, lying, thieving, assaulting, attempting suicide, wandering spirit, etc.

Prognosis is again a problem in this case. His intelligence ratio was far superior to his behaviour.

Case 10.—A Mahommedan student, aged 16, was admitted on 15th January, 1927, on the following medical certificate: "Violent antipathy against mother, ungovernable temper, irresistible thieving propensities, refused food, sometimes remained naked, throws anything that is handy at others." On admission he showed all the symptoms of a naughty child. He was abusive, extremely quarrelsome, told many lies and used to steal other patients' property and food. In fact he was unmanageable for some time and was most troublesome and pugnacious. He often ran away from the wards.

Eyes.—Quivering was present, light reflex normal, but accommodation sluggish. He had slight tremor of the hands and when he was excited his tremors were well marked.

Previous history.—His father, who is a professor, informed me that he was quite normal from the date of his birth up to the date of his abnormal conduct and temper. He was very cordial, fond of society, and was a great favourite in the school. He took a great interest in life. He was a very clever student and was reported to be good and obedient before his illness. He further stated that 10 to 12 months before the first attack in his

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

present illness he suffered from a kind of fever which was then diagnosed clinically as dengue in 1923. He recovered from the illness and was quite normal until 1924, when he developed abnormal conduct and temper and became very lazy, shirked his work and remained at home. But in December 1926 he became absolutely unmanageable and his people were simply forced to put him in a mental hospital. He improved very much under strict institutional discipline and was discharged to the care of his father on 12th May, 1928. I am still in touch with his father by correspondence and his last report shows that he is still well-behaved. He was a typical case of post-encephalitis of apache type. He was very intelligent in proportion to his conduct. He had all the symptoms of the apache type, such as quarrelsomeness, thieving, lying and wandering and pugnacity, but he never attempted suicide, though in his case slight homicidal tendencies were shown against his mother.

Case 11.—G. M. *alias* K, a Mahommedan B.A. class student, aged 25 years, admitted on 8th May, 1928, by the police as an unknown insane person. On admission he was restless, garrulous, abusive, quarrelsome, and refused to wear clothes and to eat his food and was filthy. Later he became quite euphoric and was quite normal within a month. He then gave us his proper name and address and told us that he was a student of the B.A. class.

Eyes.—Marked quivering and during the excitement stage he used to roll his eyeballs and a mild nystagmus was present. He had slight tremor of the fingers.

Personal history.—On his recovery we wrote to his people, and his uncle, a cultured man who was very anxious about his whereabouts, came immediately to see him and he gave me the following typical history. He said that the patient had had an attack of severe fever and he suffered from it for nearly two months. He was under the treatment of a hakim. During his illness he showed some tremors, complained of dimness of vision and diplopia. This happened in 1922. On recovery he was quite normal and prosecuted his studies and had a brilliant career in the school and college. In 1926 he appeared to be queer and showed some symptoms of mental excitement, for which he was again treated by a hakim. A few months after this he began to shirk his work and did not attend the college. He often used to run away from home and college and began to show abnormal conduct and temper. He became restless, quarrelsome, and told many lies and began to steal articles belonging to other persons. In 1928 he ran away from the house and they lost all trace of him until they heard from me. He was reported to be very social, intelligent and well-behaved before his serious illness in 1922. He improved very much under strict institutional discipline and was discharged on 1st December, 1928, to the care of his uncle. He was a typical apache type. Recently I was informed by his uncle that he is still well-behaved and is prosecuting his studies.

Case 12.—In 1927 I was consulted in Bombay in the case of a share broker, aged 32. It was said that four months before the appearance of the mental symptoms the patient was attacked by some fever which was diagnosed as rheumatic fever. He had suffered from diplopia and dimness of vision. On recovery from the serious illness he developed tremors of the hands and tic all over his face, which he never had before. He was sent to the hills for change of air, and on his return he attended his business as usual. A year after the illness they found in him a gradual alteration of character and temper. The patient who, before his illness, was hard working, full of interest, good natured, happy and fond of his wife and family life, was reported to have become idle, mischievous, quarrelsome, irritable, a liar and a thief. He also had hallucinations of hearing, especially of a persecutory type, and had attempted suicide more than once. A typical case of apache, and the so-called rheumatic fever was the first attack of encephalitis. No psychopathic or neuropathic history in the family.

Eyes.—Showed quivering and he complained of dimness of vision in both eyes in spite of glasses. He had ptosis of the left eye and the conjugate movements of the eyeballs were defective.

As he was unmanageable at home and a rich person he was sent up-country in care of a person who could manage him with discipline. The latter report shows that he is improving under strict discipline.

There are still half a dozen more suspected cases of apache type in the hospital, but as neither previous history nor any marked physical signs have been elicited in their cases, I have not diagnosed them as such. However I am in correspondence with their friends and relatives, with a view to eliciting the previous history.

DIAGNOSIS.

In cases of the common type, beginning insidiously with drowsiness and low fever and ocular palsies, diagnosis is easy, but it may be a matter of extreme difficulty when the incidence of the infection is much more widespread. The diagnosis may be complicated by large cerebral abscess and the ears should be examined for signs of suppurating otitis. Cerebral tumours may simulate symptoms of encephalitis lethargica, but the examination of the optic discs may clear up the diagnosis, as papillœdema is always present in cerebral tumours and never in encephalitis lethargica.

Encephalitis lethargica starting with meningeal symptoms may simulate meningitis, but the stiffness of the neck is not so marked in encephalitis lethargica, and later the examination of cerebrospinal fluid will clear the diagnosis.

DIFFERENTIAL DIAGNOSIS OF MENTAL SYMPTOMS IN ENCEPHALITIS LETHARGICA.

In the later stages various mental diseases may be closely simulated and again the central nervous system as well as the history should be closely investigated. The presence of extrapyramidial lesions and the destruction of the rhythm of contraction and reflex movements are common signs. There may be signs of Parkinsonism, alterations of rhythm, loss of association movements, salivation, ocular palsies, or a history of diplopia and fever, all of which are always suspicious symptoms of encephalitis lethargica. Some cases may be confused with epilepsy, from the history of fits which may simulate the convulsions of that disease, but the fits when observed closely will be found not to be true epileptic fits.

The catatonic stupor of dementia præcox and the early stages of dementia præcox closely resemble encephalitis Parkinsonism, but there is a profound difference in mentality. The catatonic patient is indifferent and at times extremely inaccessible and his ideas are certainly irrational. He will change his gait at a sharp command and he is usually negativistic, whereas the monotonous slur of the Parkinsonian is characteristic. If the encephalitic is roused he is always accessible, answers rationally and he will not express any of the delusional ideas so common to the catatonic. Even in his periods of excitement the encephalitic rarely voices the bizarre delusions and hallucinations so common in the catatonic and he

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

certainly does not do so in his quiescent state. The Parkinsonian struggles against his disability, whereas the catatonic seems to be wrapped in a paralysis of volition. A few hypodermic injections of hyoscine hydrobromide may be a valuable aid to diagnosis, as they frequently lead to some immediate improvement in Parkinsonism, but have no effects on catatonic cases (*vide* Cases 2 and 4).

Manic depressive psychosis is also simulated in its depressed phase, but the commonest type of encephalitis depression is relative and largely dependent upon the disability. As a rule there should be no difficulty in differentiating it from the depressed phase of manic depressive psychosis, as in the latter alteration with elation is common, and there is usually a past history of similar attacks and usually a psychopathic history in the family.

The paranoial type of encephalitis cannot be distinguished with any certainty from other paranoid psychoses in the absence of definite physical signs, or of a conclusive history of an acute attack of the disease.

The apache type must be distinguished from mental deficiency. The apache syndrome appearing in a normal child or in a normal young adult of hitherto normal behaviour and normal intelligence are strongly suggestive of encephalitis, even in the absence of other evidence of the disease. However, the diagnosis between a mental defective and an apache is rendered very difficult when encephalitis attacks those who come from an insane stock or who have been feeble minded from an early age. There may be only a vague history of an acute attack or perhaps none at all. However, it is a known fact that encephalitics are most troublesome and pugnacious patients. Their delinquencies are more wanton, more bizarre, more constant and more intractable, and yet they are very sociable and liked by all. They are seldom cowards, they are often ingenious and show some sense of humour. These characteristics are due in part to the increased motor and psychic activities which are a more constant feature in the encephalitic than in the mentally defective. The encephalitic is almost invariably intellectually superior to his conduct, whereas the intelligence and behaviour ratio in a mental defective are approximately equal.

The acute excitement in an apache may simulate mania, but the cardinal symptoms of mania are a flight of ideas, elation, and increased motor activity. The apache undoubtedly shows motor activity and some are always on the move, but their restlessness is quite different from the incessant activity of the maniac. Besides, loss of concentration and easy distractibility of the apache differ greatly from the flight of ideas of the maniac. The restless apache after a few minutes' conversation will return to the same subject, whereas passing rapidly from one subject to another is a characteristic of a maniac. The maniac covers a large field of ideational material, whereas the apache hovers round a small field. In an apache the true euphoria of the maniac is absent.

PROGNOSIS.

Questions as to prognosis are very difficult to answer. The difficulty arises from two causes. Firstly because the disease has not been under observation for a long enough time to be certain to what extent recovery holds good. And secondly, because fresh foci of the disease may occur at any time and produce fresh mental or neurological symptoms. The death-rate appears to be about 20 per cent., not taking into consideration the abortive cases. The great majority of deaths occur within the first three weeks of the illness, and after this period the prognosis as regards life is good. *Signs of ill omen* are rising temperature, deepening of stupor into coma, or noisy delirium with extreme muscular twitchings (myoclonic form). In cases which are not fatal improvement is almost always slow, extending over three to four months, but in the majority of cases recovery is complete. The cranial nerve palsies as a rule clear up relatively soon, leaving perhaps slight unequality of pupils with reaction to accommodation sluggish, but lethargy, weakness and slowness of movement persist for a considerable time. It must not be forgotten that involuntary movements may appear after a latent period of apparently normal life. Symptoms which are likely to persist for a long time—perhaps indefinitely—are mental deterioration, rigidity and tremors of the paralysis agitans type.

TREATMENT.

There is no specific treatment for the disease. The patient should be made as physiologically healthy as possible, as no line of treatment has yet been found which will seriously affect the course of disorder once established. Spontaneous recovery may occur, but generally the disease progresses slowly and surely towards a state of physical and mental helplessness. However, relentless medical men have tried numerous drugs for the treatment of encephalitis lethargica. Von Economo of Vienna has tried urotropine for the treatment of this malady with good results. He gave urotropine in large doses, 60 to 120 grains at a time, intravenously for 4 to 5 days and subsequently by the mouth in the usual small doses. Piticarin of Roumania treated three cases of myoclonic type of encephalitis lethargica and of paralysis agitans type with good results by intravenous injections of the patient's own cerebrospinal fluid, the injection being given in doses of 10 c.c. for 5 to 7 days; 8 to 10 such injections are necessary. Shortly after the first injection a considerable improvement was observed and the symptoms subsequently disappeared. Rossmere on the other hand treated a group of 8 cases with intraspinal injections of their own blood serum. The average amount of serum injected after

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

withdrawal of a corresponding volume of cerebro-spinal fluid was 30 c.c. The injections were repeated at an interval of 4 to 20 days, depending on the effect reached after each case. Recently injections of hyoscine hydrobromide were tried in the cases of encephalitic Parkinsonian at the West Park Mental Hospital and at Maudsley. It was found from clinical experiments that hyoscine is of the nature of a specific in the treatment of encephalitic Parkinsonism. In some cases the effects of hyoscine were very good, but in practically every case given the correct dose some improvement was shown. On the physical side there is diminution of the general muscular rigidity, lessening of the tremors of the face and extremities and the disappearance of excessive salivation and lacrimation, which are such frequent and distressing features of this condition. The patient becomes more alert and will occupy himself with light tasks, his gait is much freer, some expression creeps into his mask-like countenance; and he begins to exhibit an interest in things outside himself. His slurring and hesitant speech becomes more free. The question of dose is of importance. It is best to commence with small doses and increase gradually until the required effects are obtained. Hyoscine may be given subcutaneously or by the mouth. If given hypodermically, a start can be made with 1|100 grain once a day, and if necessary increase up to as much as 1|50 grain. It is seldom that a larger dose than this is found to be necessary. When administered by the mouth large doses may have to be given—even up to 1|10th of grain 3 times a day. But 1|50 grain even by the mouth is not as a rule exceeded. It should be given just after meals, since if taken before food the dryness of the mouth and throat makes mastication and deglutition somewhat difficult. To combat some of the unpleasant symptoms of hyoscine therapy, such as paralysis of accommodation and the dryness of the mouth, occasionally pilocarpine nitras 1|10th of a grain is useful. It is noteworthy that such treatment has been administered for a period of two years and no deleterious effect whatever has resulted from the drug and that no tolerance to it has developed.

Recently tryparsamide and argotropin have been tried. Tryparsamide has been lately largely experimented with in cases of general paralysis and it is proved that it is the only arsenical preparation which seem to gain access to the central nervous system in a way which no other preparation has yet done, and therefore it opens a new chapter in the treatment of neuro-syphilis and also encephalitis lethargica. Cases of encephalitis lethargica experimented on with this drug have shown no further progress of the disease since receiving this drug. It is given in a course of eight weekly intramuscular injections of 2 to 3 grammes.

Argotropin was first recommended by Dr. Wimmer of Copenhagen. It is a combination of 1 per cent. of colloidal silver and 20 per cent. hexamethylene tetramine. It is administered intravenously, one ampoule of 5 c.c. being given every day. A course consists of 8 to 10 injections. Time forbids more than the mere mentioning all other methods of treatment. Pyorrhœa and other septic troubles are extremely common and correcting of them is absolutely necessary.

In conclusion I may say that hyoscine is of undoubted value in the Parkinsonism of chronic encephalitis. Its action is a specific one, but it is important to remember that its action is temporary and its prolonged use does not lead to intolerance or to deleterious effects. Though in the majority of cases the full benefit of hyoscine can only be obtained by hypodermic injections, yet there is no doubt that in many cases considerable benefit follows its oral administration. I tried hyoscine hydrobromide injections in all my encephalitis lethargica cases of Parkinsonian and tremor types and met with good success in some and some improvements in others.

I injected 1|100 grain of hyoscine hydrobromide daily for the first week, and for the remaining period 1|50th of a grain. Once or twice a week according to the circumstances of the case pilocarpine nitras 1|10th of a grain was given to combat the uncomfortable symptoms due to hyoscine. Injections were stopped after a six months' course in all cases, whether improved or otherwise. In the case of the apache type, the treatment is purely symptomatic, but I have often found that a good talking to and strict disciplinary measures are the soundest treatment when an apache becomes unmanageable and shows symptoms of lying, thieving, quarrelsomeness and pugnacity. When such behaviour is reported to me I immediately send for the patient to my office and give him a good talking to on the subject, shut him up for a week or more in a single room, and if necessary put him on half diet, cut all his cigarettes, stop all his parole, and admission to the amusement hall and games. The treatment goes home to him and he tries to improve his abnormal conduct and temper. In England they experimented by sending the apache type to juvenile jails instead of to mental hospitals. The results were good. Had my Case 8 (Apache type) not improved by the ordinary seclusion treatment, I determined to send him to a juvenile jail as an experiment. It is possible to improve early cases of the apache type by such disciplinary measures, mixed with suggestions and kindness.

THE SPECIES DISTRIBUTION OF HOOKWORMS IN INDIA.

By P. A. MAPLESTONE, D.S.O., M.B., Ch.B., D.T.M.

(From the Hookworm Research Laboratory, School of Tropical Medicine, Calcutta. Supported by the Indian Jute Mills Association).

SINCE it has become recognised that the *Ancylostoma duodenale*, is much more injurious to its

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

host than is *Necator americanus*, it is obviously of more practical importance rather than that of mere academic interest to know the relative distribution of the two species in any country. There are a few records of this nature referring to India, and, although the general conclusion to be drawn from these papers is that *N. americanus* is the commoner worm, they are by no means unanimous in this respect. It is true that many of the records are based on a very small number of cases, and so they are perhaps not a true index.

The following figures have been obtained from in-patients treated in the Carmichael Hospital for Tropical Diseases, Calcutta. Only a few of the patients were admitted for hookworm treatment especially; the majority of them were suffering from other diseases with hookworm infection as an added factor. They have been divided into three classes, viz., (1) Cured, (2) Not cured, (3) Doubtful cures.

(1) *Cured.*—This means that subsequent stool examinations were uniformly negative for hookworm eggs.

(2) *Not cured.*—Hookworm eggs were still present after one or more treatments. The number of uncured cases appears fairly high, but this is because in many instances the infection was reduced to negligible proportions, and the patients were discharged as the primary condition for which they had been admitted to hospital was cured. An interesting fact that has emerged in the course of this inquiry is that Lane's centrifuge was introduced about half-way in the series, as a means of establishing a cure. Before the use of the centrifuge 68 per cent. of cases were returned as cured, and after the centrifuge was used the cure rate fell to 47 per cent., there being no other change in treatment or diagnosis whatever.

(3) *Doubtful cures.*—Patients who had to be discharged for other reasons before it could be ascertained with certainty whether they had ceased to pass eggs.

Table I has been compiled by recording the species of worms recovered from all the cases, following treatment, and Table II, gives the actual number of worms passed.

TABLE I.

Class of case.	Necator only.	Ancylostoma only.	Mixed infections.	TOTAL.
Cured ..	240	30	54	324
Not cured ..	138	38	55	231
Doubtful ..	48	22	21	91
TOTAL ...	426	90	130	646

TABLE II.

Class of case.	WORMS RECOVERED.			
	NECATOR.		ANCYLOSTOMA.	
	Males.	Females.	Males.	Females.
Cured ..	2,577	2,781	374	538
Not cured ..	2,780	3,392	1,410	1,772
Doubtful ..	928	1,025	429	628
TOTAL ..	6,285	7,198	2,213	2,938
	13,483		5,151	

Most of the cases from whom these figures have been obtained came from Calcutta and its environs, so they may be taken as an indication of the species distribution of hookworms in Southern Bengal. *A. duodenale* is present in 34 per cent. of cases, and 14 per cent. of these are pure infections; *N. americanus* is present in 86 per cent. of cases, and 66 per cent. of these are pure infections. Tomb (1922) in the Asansol district found that 70 per cent. of the worms recovered after thymol treatment were Necators, and that 30 per cent. were Ancylostomes among the miners, and that 64 per cent. were Necators and 36 per cent. were Ancylostomes among the villagers, and he found that Ancylostomes were never present as a pure infection, but were always accompanied by Necators. The *Report of the Rockefeller Foundation* (1922) also found that in Southern India, Necator was the commoner, and that when Ancylostomes were present they were only in small numbers and were invariably mixed infections with Necators. This report also states that coolies in Madras who had come from Bengal, the United Provinces, and the Central Provinces were almost always infected with Ancylostomes, and that Necators were often present but only in small numbers. The worms obtained from an unknown number of coolies on a tea estate at Sibsagar were examined, and of 384 worms only 3 were Ancylostomes.

In the Berhampore Gaol, Lane (1913) examined the worms obtained from 150 prisoners, and he found that 60.7 per cent. were infected with Ancylostomes, and 64.6 per cent. were infected with Necators; the actual numbers of worms obtained were 1,322 Ancylostomes and 1,283 Necators. He also found that 9.3 per cent. harboured *Ancylostoma braziliense*, but the fourteen cases that showed this infection only had 20 worms between them. Lane does not say whether he found pure infections with any species.

In Bihar and Orissa, Korke (1926) published two papers on ancylostomiasis in these districts,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and he found that out of 685 cases in Bihar the predominant species was *A. duodenale*, but he gives no figures. He also says that there is apparently a line of demarcation between the distribution of the two species in Bihar. In the camps Duia and Maclellan he found, "..... almost without exception the parasites were identified as Necator."

In the Madras Presidency, Mhaskar (1919) says that Necator is much the commoner species, being nearly 100 per cent. in most areas, but that Ancylostoma varies from 80 per cent. in Tangore to 10 per cent. in Madura.

A. braziliense does not appear to be a very frequent human parasite in India, for the only other reference to it in this capacity, in addition to the one by Lane, quoted above, is the record of its presence in Burma. In this connection Chandler (1927) quotes Jolly who found that 2.5 per cent. of the worms recovered in that country were of this species, and that 5.6 per cent. were *A. duodenale*, the remainder being Necator. Chandler examined six post-mortem cases in Rangoon and found that all the cases harboured *A. duodenale*, five of them had one or more *A. braziliense*, and there were no Necators. He also examined many hundreds of worms obtained after treatment in Calcutta and never found a single *A. braziliense*, despite the fact that nearly all the dogs and cats in Calcutta harbour this species. He suggests that there are certain conditions in Burma and perhaps in Berhampore which are suitable for the propagation of this worm as a human parasite, and that the same conditions are absent from Calcutta.

Although the general indications from the present investigation and from those to which reference has been made are that Necator is much commoner than Ancylostoma, it seems probable that fuller inquiry along these lines would reveal certain foci where *A. duodenale* is the predominant species and that it is therefore of greater importance in India than is generally recognised.

REFERENCES.

Chandler, Asa C. (1927). The prevalence and epidemiology of hookworm and other helminthic infections in India. Part VI, Burma. *Indian Journ. Med. Res.*, Vol. 14, p. 733.

Korke, Vishnu T. (1926). Observations on ankylostomiasis in some areas in British India. *Ibid.*, Vol. 13. p. 493 and Vol. 14, p. 383.

Lane, Clayton (1913). Ankylostomes and ankylostomiasis in Bengal. *Indian Med. Gaz.*, Vol. 48, p. 417.

Mhaskar, K. S. (1919). The prevalence of ankylostomiasis in Madras. *Indian Journ. Med. Res.* Vol. 7, p. 412.

Rockefeller Foundation (1922). Distribution and control of hookworm disease in India. International Health Board. *Ibid.*, Vol. 10, p. 295.

Tomb, J. W. (1923). Hookworm infection in the coal mines of Bengal. *Indian Med. Gaz.*, Vol. 58, p. 473.

THE VALUATION OF CHARAS.

By D. N. CHATTERJI, B.A., B.SC., A.I.C.,
Chemical Examiner
and
M. B. ROY, B.SC.,
Assistant Chemical Examiner to the Governments of U. P. and C. P., Agra, United Provinces.

THE distribution and sale of charas on importation into India are controlled by excise regulations, and its assay is of importance to Government. During the course of our work a large number of samples were received by us for examination. We were at times in difficulty for want of a speedy and reliable method of assay to get through the work quickly when we had pressure of other work. The most dependable method available up to the present is the physiological one, which consists in the administration of the drug usually to a dog. This method has several well-recognised drawbacks, its chief limitation being that dogs vary considerably in their susceptibility towards the drug. Difficulty is also experienced in administering the drug to the animals, as they often instinctively refuse to take it beyond a certain dose, however much the attempt may be made to conceal its presence in the food with which it is administered. Moreover, the dogs must be given sufficient rest after each experiment. Several workers have from time to time attempted to devise a method of standardising Indian hemp or its preparations by the chemical properties of the drug. Hooper (*Pharmaceutical Journal*, 1908, 81, 347) amongst them claimed that the determination of the iodine value could be used for the standardisation of charas, but Marshall and Wigner (*British Medical Journal*, 1, 1911, 1176) did not find the iodine number of "certain value" and in their opinion it could not be used as a substitute for physiological standardisation.

We thought, however, that the iodine number was capable of indicating the physiological strength of charas, hence we considered it desirable to re-examine Hooper's method, along with certain other chemical tests, some of which were tried in the past, and to correlate them with the results obtained by physiological tests.

In the determination of the iodine number, instead of strictly adhering to Hooper's procedure, we adopted the following method. Two grammes of charas were extracted with rectified spirit and the tincture made up to 100 c.c. with alcohol. Ten c.cs. of this were evaporated down, Hubl's iodine solution added and the iodine number of the extractive matter was determined in the usual way. We adopted this procedure to avoid the weighing of the alcoholic extract as we found that the latter did not dry to a constant weight at 100°C., but continually diminished in weight.

For the determination of the extractive matter our method was to distil off on a water bath the alcohol from a definite volume of the tincture as

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

obtained above, and then to take a single weight after drying the residue for a further period of 5 minutes at 100°C. in an air oven.

For the physiological tests we used the same dog in all our experiments in order to eliminate the error due to idiosyncrasy in different animals. The dog, in our experiment, maintained a practical uniformity of the minimum effective dose towards the drug. The physiological number expressed by us represents the number of milligrams of extractive matter capable of visibly affecting the dog. The following results were obtained on examination of pharmacologically active samples of charas, the results being calculated on the weight of samples after drying at 100°C. for 2 hours.

CONCLUSIONS.

A comparison of the acetyl numbers of good and bad samples, as noted above, confirms the view of Marshall and Wood (*British Medical Journal*, 1, 1912, 1234) that it cannot be used as a substitute for physiological standardisation. The percentage of extractive matter and acid value too are of no significance.

The iodine number on the other hand is found to be a fair index of the pharmacological quality of charas. If this number exceeds 220 a sample may be considered pharmacologically good, but if it be below 200 the sample may be condemned as deteriorated. For a value lying between these figures we would propose to carry out a physiological test. The advantage gained by determining the iodine number is of considerable practical value, inasmuch as the necessity for doing a physiological test in many cases would be obviated, resulting in the saving of a good deal of time and labour of the analyst.

TABLE I.

Particulars.	Loss on drying at 100°C. for 2 hours.	Ash per cent	Extract per cent.	Iodine value.	Acid value.	Acetyl value.	Physiological number.
Cawnpore Govt. Block ..	7·8	46·6	40·1	234·8	15·9	139·0	120·3
Kheri	6·1	45·5	40·8	220·5	3·4	87·0	130·5
Kheri 2 (B.W.H.)	7·8	44·0	41·2	233·0	7·3	103·5	123·6
Kheri 3 (B.W.H.) ..	10·2	46·0	40·0	236·3	6·9	106·2	125·5
Partabgarh. Standard.	9·5	44·1	37·4	221·7	5·6	113·4	104·7
Sitapore	8·4	40·9	38·9	226·8	5·5	84·5	128·3
Sample "A" obtained from the Punjab ..	7·3	40·5	39·3	208·1	0·3	157·0	110·0

(It will be noted that except sample "A" all had an iodine number exceeding 220.)

A sample of charas which had partially deteriorated in its physiological property yielded the following figures:—

TABLE II.

Particulars.	Loss on drying at 100°C. for 2 hours.	Ash per cent.	Extract per cent.	Iodine value.	Acid value.	Acetyl value.	Physiological number.
Partabgarh seized ..	6·3	59·2	30·4	205·2	4·8	115·5	152·0

The following table shows the results obtained with practically inert samples:—

TABLE III.

Particulars.	Loss on drying at 100°C. for 2 hours.	Ash per cent.	Extract per cent.	Iodine value.	Acid value.	Acetyl value.	Physiological number.
Pilibhit	8·4	33·9	40·3	155·1	9·35	104·5	439·3
Bara Banki ..	5·4	36·6	39·8	147·5	9·79	59·2	*
Sample "B" obtained from the Punjab Excise Dept. ..	5·9	37·0	40·7	194·6	1·49	..	*
Sample "C" obtained from the Punjab Excise Dept. ..	4·7	49·9	34·1	187·7	1·89	..	*

*In these cases the dog received 1,050, 2,400 and 2,800 milligrams without any effect. The dog refused to take more.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

RADIOLOGICAL EXAMINATION OF THE LIVER IN CASES OF SUSPECTED AMŒBIC ABSCESS.

By J. H. BARRETT, D.R.M.E.,
CAPTAIN, I.M.S.,
Quetta.

A PERUSAL of the more recent textbooks which deal with tropical diseases reveals the fact that the radiographic diagnosis of amœbic abscess has scarcely been considered at all. To me this omission seems a great pity. There are certainly many cases where the *x*-ray method, carefully carried out, may afford the greatest help. These may be conveniently classified as follows:—

(*i*) *The obscure case without well-marked symptoms.*—A patient comes to hospital complaining of vague subcostal pain, slight temperature, headache, furred tongue. There may or may not be a history of dysentery. Laboratory examination of the stools may reveal nothing abnormal. Perhaps the blood picture is inconclusive and the total leucocyte count may be about 12,000 to 14,000 per c.mm. The blood is often negative to malarial parasites. Clinically there may be sufficient signs to warrant a diagnosis of either (*a*) hepatitis, (*b*) diaphragmatic pleurisy, (*c*) gall-stones, or possibly of simple intercostal neuralgia, or again of a small liver abscess. What then can radiology do? The clinician has little to fear from either hepatitis or a simple diaphragmatic pleurisy. He is more concerned with the exclusion of gall-stones, cysts, liver abscess, local pleurisy with small effusion, or possibly malignant disease. In those cases surgery may have to be employed, and it is in such a case that *x*-rays will usually afford him the greatest help. Radiology will often decide for him whether the case is a surgical one or not. It may be pointed out at once that the *x*-ray findings are only contributory links and must be taken into consideration with the rest of the chain of evidence. The *x*-ray link may be the most powerful of all.

(*ii*) *Cases which have been diagnosed as hepatitis.*—The physician has made a diagnosis of hepatitis, yet for some reason progress, in spite of emetine, is slow. He wants to know whether there is some other condition present as well, to explain the lack of reaction to treatment. The radiologist may be able to give valuable assistance in this way. Suppose he finds both domes of the diaphragm of normal contour, and elevation, and moving actively with respiration and with perfectly clear lung-fields above, then he is justified in stating that there is no *x*-ray evidence of either pleurisy with effusion, basal pneumonia, or liver abscess affecting the diaphragmatic surface. The exclusion of such conditions is valuable in giving a prognosis on the case. If on the other hand the radiologist finds a high dome, displacement of the heart, local bulge and dome fixation and definite obscuring of the basal lung fields or possibly a costo-phrenic or cardio-phrenic fluid line, then it becomes at once apparent that the case is something more than a simple hepatitis, and the question of employing the exploratory needle for either liver or pleura will have to be decided. The *x*-ray findings will help in this decision, as it is usually difficult to mistake free fluid or pus in the pleura for anything else.

After radiological examination of a number of cases of liver abscess, I have come to the conclusion that a fair sized abscess of the liver, adjacent to the right dome of the diaphragm, always produces a basal œdema of the lung. With a soft *x*-ray tube and an electric current of 3-4 m.a. this can usually be demonstrated on the fluoroscopic screen, provided the other lung is normal and lights up well to enable a comparison to be made.

(*iii*) *Cases in which a doubtful diagnosis of liver abscess has been made.*—These are the cases which have been diagnosed clinically and the surgeon seeks radiological confirmation before operating. Also he wishes to exclude possible complications, especially with regard to the adjacent lungs and pleuræ. These radiological examinations are important, and may reveal the unexpected. One case in my experience had a quiescent tubercular focus in the left lung apex. Another had a whole rifle bullet behind the heart. Another had a small metal screw (inhaled) near the diaphragm. Another had a calcified hydatid in the lung, and yet another had an un-resolved pneumonic patch at the lung base. These are cases which may give rise to no symptoms, therefore it is well to have an *x*-ray investigation before operation.

THE RADIOLOGICAL EXAMINATION.

Posture.—The patient is first *x*-rayed on the couch lying face downwards. The tube target is centred over the 5th dorsal vertebra. Two photographs are taken, one in inspiration and one in expiration. The patient holds his breath during the exposure, which should be as short as possible. A further photograph is taken with the patient lying on his back. Centering is effected over the centre of sternum opposite the fourth costo-chondral junction. This photograph is taken in inspiration.

Next, if the patient is not too ill, he is examined in the upright position (fluoroscopic) for about three minutes, and a rapid inspection made of the region of the domes of the diaphragm. If the patient is too ill this examination may be made in the sitting position. In routine examination I do not think stereography or teleo-rœntgenography are necessary.

Although cases vary considerably, I think if the investigator will look for the signs tabulated, he will be able frequently to give useful information to the clinician.

Cases examined radiologically.—Forty-two cases were examined radiologically during the period 1st May 1925 to 1st May 1928. Out of these cases five were reported as liver abscess

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and three of these were subsequently proved to be such at operation. Twenty-three cases were definitely reported negative to liver abscess. Of the remaining fourteen cases eight were suspected clinically of having gall-stones; these eight were negative radiographically to liver abscess or gall-stones and they got well subsequently without operation. Out of the remaining six cases examined the *x*-ray signs were indefinite in five, and one case was diagnosed hydatid of the liver, and the cyst was demonstrated on the *x*-ray film.

Radiological findings in the Routine Examination of cases suspected of Amœbic Abscess of the Liver.

Normal.	Hepatitis.	Liver abscess.
(1) Lung fields clear.	Lung fields may or may not be clear.	Lung fields usually obscured at the right base.
(2) Diaphragm silhouette clear.	Diaphragm silhouette may or may not be clear.	Diaphragm silhouette (right) usually obscured.
(3) Diaphragm movement range may reach 2 inches.	Diaphragm movement range rarely more than 1 inch.	Diaphragm movement range (right) practically always under 1 inch and commonly practically immobile.
(4) Diaphragm, no local bulge.	Diaphragm, no local bulge.	Diaphragm often local bulge on right dome.
(5) Palpation, no subcostal pain.	Palpation, subcostal pain usual.	Palpation, subcostal pain may be considerable.
(6) Diaphragm silhouette always seen.	Diaphragm silhouette always seen.	Diaphragm silhouette may be completely obscured.
(7) Heart and lungs no displacement.	Heart and lungs no displacement.	Heart and lungs may be displaced.
(8) See-saw movement never present.	See-saw movement not usual.	See-saw movement (right dome up and left dome down) may be present.
(9) No lung complications present.	Lung complications rare.	Lung complications (pleurisy, etc.) are not uncommon.
(10) Diaphragm position normal.	Diaphragm position normal usually.	Diaphragm often abnormally high.

REMARKS.

1. The diaphragm range is measured on the screen with a compass.
2. The trunk-vertical position is the best.
3. The fluoroscopic part of the examination need not take more than a few minutes.
4. An opinion cannot be given on fluoroscopy alone. Skiagrams are essential.
5. In fluoroscopy use an electric current of 3 m.a. I found that larger currents are unnecessary; besides they may give rise to screen-lag.

CONCLUSIONS.

In cases suspected of liver abscess the *x*-ray method of examination affords valuable information in the following manner:—

(*a*) A doubtful diagnosis of amœbic abscess made on the clinical signs may be cleared up.

(*b*) The presence or absence of lung complications may be indicated.

(*c*) Cases negative to amœbic abscess, radiographically usually yield to non-operative measures, i.e., emetine, etc.

(*d*) The *x*-ray examination aids prognosis, e.g., lung complications add to the gravity of the disease and clear lung fields are indicative of more favourable prognosis.

(*e*) Within my experience no case where the *x*-ray evidence was wholly negative has subsequently been proved to have been a case of amœbic abscess.

PARIS GREEN AS AN ANOPHELINE LARVICIDE.

By S. N. SUR, M.B., D.P.H. (Lond.), D.T.M. (Liverpool)
Assistant Director of Public Health, Malaria Research, Bengal,

and

HARIPADA SARKAR, L.M.S., D.P.H. (Cal.),
Assistant to the Assistant Director of Public Health, Malaria Research, Bengal.

THIS paper has been written mainly for the information of practical malariologists and in it the observations on Paris green of Drs. Gosio, Missiroli, Chalam, Hacket, Dalal and others as well as of our own have been put together. The merits and demerits of this remedy and its probable cost of operation in Bengal have been discussed, which may be of interest to the field workers.

Paris green or Schweinfurt's green is a chemical compound of arsenic, copper and acetic acid. Its chemical name is copper aceto-arsenite, its formula being $3\ Cu\ H\ As\ O_3 + Cu\ (C_2\ H_3\ O_2)_2$. It is therefore a double salt of copper arsenite and acetate. It is a microcrystalline powder of emerald green colour. It is practically insoluble in water. It is perfectly soluble in ammonia and concentrated acids. In the pure state it contains 58.6 per cent. of arsenious anhydride ($As_2\ O_3$). Paris green is often adulterated. The percentage content of arsenious anhydride should therefore be ascertained from the dealer when ordering it for larvicidal purposes. Some manufacturers guarantee it to contain 55 to 58 per cent. of arsenious anhydride.

It has been used with great success as an anopheline larvicide in America and Southern Europe. It has also been used with success by Dr. Chalam, Dr. Dalal and others in India.

For use Paris green is diluted with some inert dust in the proportion of 1 part of Paris green to 99 parts of road dust by weight. In the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

absence of road dust, clay dust, sawdust, powdered French chalk, or soap stone powder may be substituted. Soap stone or steatite can be had locally in India and is known as *ramkhalli*. The mixture must be perfectly dry before use, otherwise the presence of the least moisture will cause the mixed dust to sink soon. It will also not spread over the surface of the water to form a film of the powder. As the season for anti-malarial operations in Bengal is just the one when one gets frequent showers of rain, it is very important that the road dust should be collected in the dry season and stored for use in the wet season. It is better sieved before putting into bags. If this precaution is not taken there will be great difficulty in securing dry dust at the time when it is greatly needed. In such cases French chalk powders may be used as diluent but will greatly enhance the cost of operation, although the price of Paris green itself may be insignificant.

Experiments with Paris green were carried out in a tank near the Central Jail at Krishnagar in the months of November and December, 1928. The diluent used was dry road dust and the mixture was applied by means of a hand blower devised by Dr. Hacket. The tank was full of such aquatic vegetation as *Vallisneria, Utricularia* and *Hydrilla*. In our experiments, Paris green was mixed with dry road dust in the proportion of 1 in 100 by weight. It was found very effective in killing anopheline larvæ as will be evident from the experiments detailed below. In our experiments the same pan of 10 in. diameter was used for collection of larvæ. In each case 15 dips were made to compare the number of living larvæ and the same place was tested.

EXPERIMENTS.

	I		II		III				
	Before spraying.	24 hours after spraying.	Before spraying.	24 hours after spraying.	Before spraying.	½ an hour after spraying.	1 hour after spraying.	2 hours after spraying.	24 hours after spraying.
Number of larvæ	94	nil	82	8*	43	42	23	18	nil
Average per dip	6·3	nil	5·5	nil	2·9	2·8	1·5	1·2	nil
A. rossi ..	22%	nil	27%	nil	11%	12%	17%	39%	nil
A. barbirostris	6%	nil	2%	nil	nil	nil	nil	nil	nil
A. fuliginosus	72%	nil	71%	nil	89%	88%	83%	61%	nil

* They could not be identified as the larvæ seemed to have just emerged from the egg-shells during the course of the day. They were very tiny.

It is therefore seen that total eradication of larvæ cannot be expected within 2 hours of the application of the powder. A total eradication may be expected within 24 hours. It also becomes apparent from the experiment II that it has no action on the eggs which hatched out during the course of the day into small tiny larvæ. From experiment III it seems that *A. fuliginosus* larvæ are more vulnerable than *A. rossi* larvæ. Experiments were also carried out in dishes on the life of Culicine larvæ and Anopheline pupæ. It was found that the mixture had no effect on them.

The alimentary tracts of dead larvæ were dissected out and the contents were examined under the microscope. These showed the presence of typical granules of Paris green in the different regions of the œsophagus and the gut. It therefore acted as a stomach poison. Under ordinary conditions the dust forms a film on the surface of the water and floats for some time.. The anopheline larvæ being surface feeders the minute granules of Paris green are taken automatically by them with the inward current produced by their feeding brushes. Arsenic and copper being powerful stomach poisons they die even when a very minute quantity of Paris green is ingested by them.

The quantity of the mixture required to kill all anopheline larvæ in a water area of 20 square yards was about 3 ounces, containing only 14 grains of Paris green. The cost is therefore insignificant. It may be had at Rs. 88 per 1 cwt., which works out the cost of Paris green as a larvicide to be about one anna per 1,000 square feet of water surface. If the diluent is road dust collected and stored beforehand the expense is inconsiderable. But if the diluent used is French chalk powder or steatite powder, the cost would come to about 6 annas every 1,000 square feet, the price of French chalk powder being about Rs. 4-8 per cwt.

The powder may be used by means of hand bellows as devised by Dr. Hacket or by means of any powder blowers such as found in the market like "Misto" powder blowers. When a breeding-place overgrown with tall grass or water hyacinth is to be treated, it is better to have a special long nozzle attached to the blower to be introduced into the growth before blowing the powder. Otherwise powder blown over the growths will settle on the leaves and the larvæ would not be affected.. In big swamps which are full of weeds not only in the edges but also in the mid portion, it is better to apply it over the whole surface. This may be done by the operator sitting on a *bhela*—an improvised float made of *sola* or Indian pith such as fishermen use or made of blocks of plantain trees. The only precaution required is that the operator should always keep himself on the windward side of the dust cloud.

Paris green should be applied at least once every six days. As it has no action on the egg stage and the pupal stage of anophelines, the interval between the two applications must therefore

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

be shorter than the period which takes just hatched out larvæ to develop into pupæ. As the length of this period varies in different seasons, in summer the time taken being very much shorter than the average, the interval must not therefore be prolonged more than six days.

At present a mixture of pesterine and kerosene or fuel oil and kerosene is being largely used as a larvicide in areas where anti-malarial operations have been undertaken in Bengal. The cost of this mixture is about 5 to 6 annas per 1,000 square feet.

The advantages of the use of Paris green as a larvicide are:—

(1) It is inexpensive in comparison with pesterine or kerosene, etc., the cost being about an anna per 1,000 square feet. But if French chalk powder is used as a diluent, the cost per 1,000 square feet comes up to the same level as that of pesterine or fuel oil.

(2) It has no smell, whereas the odour of pesterine or liquid fuel is very much objected to by the public.

(3) The solubility of Paris green is so negligible and the quantity used is so small for the area treated that there is no fear of toxic effects. It sinks to the bottom of the tank after a certain period, and being practically insoluble it does not materially affect the composition of the water. According to Drs. Gosio, Missiroli and Hacket, even when Paris green comes in solution in minute quantity, there is no accumulation of arsenic in solution in the water, as it is eliminated within 48 hours by natural biological processes through the agency of aquatic vegetation, viz., *Penicillium brevicaule*, a species of lower fungus which is present in most water collections and absorbs all arsenic in solution. In our experiments we found that the quantity used was not toxic to even small aquatic fauna such as fish, frogs, leeches, water-bugs. Ducks and cattle using the water were not affected.

(4) It is equally effective in weedy water collections as in clean ones; the cost of preliminary expense for the clearance of weeds before spraying with oil is thus saved.

But it has the following disadvantages:—

(1) It cannot kill the eggs and pupæ of anophelines and has no effect on the aquatic stage of culicines. In rural towns where there is some sort of water works without underground drains the mosquito nuisance is so great that the campaign should not only be against anophelines but also against culicines. In such cases Paris green is useless.

(2) A shower of rain or high wind just after the application may vitiate the result. In such cases, it should once again be applied.

(3) It may not be useful in waters with a strong current such as are found in submontane regions.

(4) Although fish and ducks have been found not in the least affected, there is a general apprehension of arsenical poisoning by doctors, as tank water is very much used by the Indians for drinking purposes. Where there is a piped water supply, its use is safe.

REFERENCES.

Gosio and Missiroli (1927). *China Medical Journal*, Vol. 41.
Dalal and Madon (1927). *Indian Medical Gazette*, Vol. 62.
Challam (1927). *Indian Journal of Medical Research*, Vol. 14.
Hacket (1927). *Journal of Tropical Medicine and Hygiene*, Vol. 30.

SIMPLE TESTS FOR STOCK SOLUTIONS OF QUININE AND POTASSIUM IODIDE.

By J. W. D. MEGAW,
COLONEL, I.M.S.,
and
HERBERT HAWLEY, M.SC., F.I.C.,
Public Analyst, Madras Presidency.

IN a note in the *Indian Medical Gazette* of May 1928 the senior writer in collaboration with Professor Sudhamoy Ghosh and Mr. N. R. Chatterjee of the Calcutta School of Tropical Medicine called attention to the great frequency with which stock solutions of quinine in hospitals and dispensaries are seriously under the stated strength. A simple test was given by which inspecting officers could easily check the strength of the solutions.

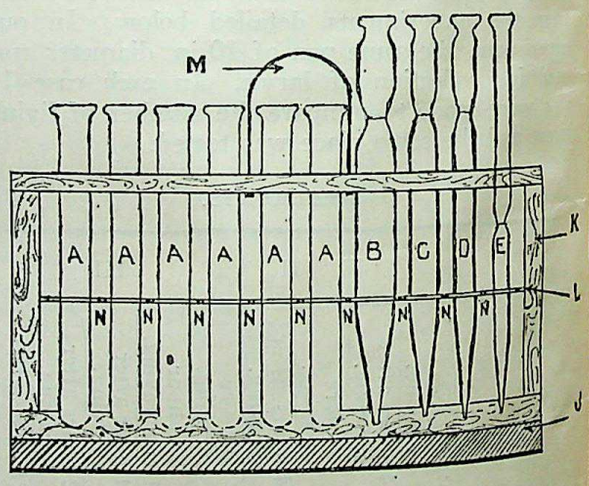


FIG. I.

Teakwood rack (drawn approximately to scale).
A Test tubes of equal calibre.
B Pipette for quinine test reagent. (*Capacity about 2|3 that of test tubes.*)
C Pipette for iodide test reagent. (*Capacity slightly less than ½ that of the test tubes.*)
D Pipette for iodide mixtures. (*Capacity about ½ of C.*)
E Pipette for quinine mixtures. (*Capacity about 1|10 that of B.*)
J Lead plate for stability.
K Teakwood frame.
L Wire supports to keep test tubes in place.
M Wire handle for rack, placed on one side of the cross piece.
N Wires running between the supports to keep the tubes in position.
(A perforated tin plate may be used instead of the wires L and N.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Within the past year a large number of samples were taken by the senior author for examination from head-quarters hospitals and smaller dispensaries in the Punjab and Madras. The mixtures were usually much below the stated strength except in those dispensaries in which the compounders were aware that I was in the habit of checking the solutions.

At my recent inspections most of the mixtures were found to be up to the proper strength, but this was probably because a warning notice had been issued to all District Medical Officers.

In some dispensaries the warning had not been received or had been ignored as can be seen from the following results of accurate analytical tests of stock mixtures made quite recently in the Madras Presidency.

		Stated strength.	Actual strength.
Head-quarters Dispensary	A	10 grains	1.6 grains.
" "	B	10 "	3.1 "
" "	C	10 "	7.2 "
" "	D	10 "	7.2 "
" "	E	10 "	5.4 "
" "	F	5 "	3.9 "
Other Dispensaries	A	5 "	2.2 "
" "	B	5 "	3.7 "
" "	C	5 "	2.4 "
" "	D	5 "	3.3 "
" "	E	5 "	3.4 "
" "	F	10 "	1.2 "
" "	G	10 "	Nil.
" "	H	10 "	12.2 "
" "	I	10 "	3.5 "
" "	J	10 "	6.8 "
" "	K	4 "	0.6 "
" "	L	4 "	2.5 "
" "	M	4 "	0.6 "
" "	N	4 "	2.8 "

The iodide of potash mixtures were usually up to strength, in spite of the fact that the compounders did not know that tests were likely to be made, but in some cases serious deficiencies were found, for example one case in which it was less than 3 grains to the ounce instead of 10 grains.

Many of the medical officers were astounded at the results of the tests; some of them were indignant at first that the compounders should be suspected of guile, indeed one experienced District Medical Officer assured me that tests were unnecessary as he had implicit confidence in his compounders.

The test already published is quite satisfactory, but experience has shown that readings can be made more quickly and readily if the stock and control quinine solutions are diluted before adding the reagent. Solutions of 10 grains to the ounce may be diluted up to 6 or 8 times before the reagent is added and solutions of 5 grains up to 3 or 4 times. When this is done it is easier to detect at a glance any great deficiencies in the stock mixtures, also the precipitate falls more rapidly.

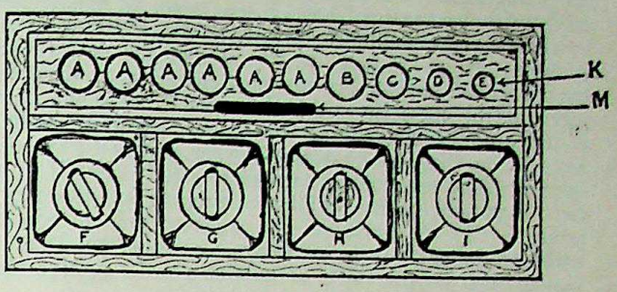


FIG. II.

Arrangement of test case seen from above.
A to E and M as in Fig. I.
F One-ounce bottles for quinine control solution.
G One-ounce bottles for iodide control solution.
H One-ounce bottles for quinine test reagent.
I One-ounce bottles for iodide test reagent.

Note.—The mouth of the bottles should be large enough to receive the pipettes. The rubber bulbs of the pipettes will be above test tube rack.

A New Simplified Test for Quinine Solutions.

The junior author has devised a still simpler test which will be found to be very satisfactory; it can be recommended for general use.

The requirements are:—

I. Quinine Test Reagent made up of—
Pure phosphotungstic acid, 1 ounce.
Dilute sulphuric acid (B. P.), 5 ounces.
Rectified spirit, 12 ounces.

II. Control solutions of sulphate of quinine.
These should be made up accurately to the same formula as the solutions which are to be tested. (Usually 5 or 10 grains to the ounce.)

III. Small test tubes of equal calibre (about 1|3 to 2|5 inch in diameter and 3 to 4 inches in length) are convenient.

IV. A small pipette holding about ¼ c.c. (a pen filler or a narrow glass tube with a mark by which equal quantities can be delivered will serve if a graduated pipette is not available).

The quantity to be delivered need not be ¼ c.c., all that is needed is to ensure that exactly similar quantities of the quinine solutions are delivered into each tube and that the volume of the solutions should be about one-tenth the quantity of the reagent when solutions of 10 grains to the ounce are being tested and about one-fifth in the case of solutions of 5 grains to the ounce.

Method.

Add equal quantities of the reagent to two tubes of equal calibre to a depth of about 2 inches. A mark may be made on each of the tubes to facilitate measurement or a special pipette holding about 2½ c.cs. may be used. To one of the tubes add a measured quantity (usually ¼ c.c.) of the control solution of quinine, mix well by inverting the tube several times while keeping it closed by the thumb or by a cork (vigorous shaking must be avoided). To the other tube add an exactly equal quantity of the solution which is being tested and mix it in the same way. Again mix the contents of both tubes simultaneously so that sedimentation may start at the same moment in both tubes. Place the tubes in an upright position; after 10 minutes or so the depth of each precipitate will be roughly proportional to the amount of quinine contained in the mixture. Even after 5 minutes a good idea may be formed of the relative strengths of the two mixtures by comparing the heights of the clear columns of liquid above the precipitates. If the apparent variation is slight, an accurate chemical analysis may be made by sending a sealed sample to a qualified analyst.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

If any doubt exists as to the purity or strength of the powder from which the quinine solution was made the compounder should be asked to make up a fresh mixture under personal supervision; some of this should be examined simultaneously with the existing stock solution. It will usually be found that the defect does not lie in the powder but in the preparation of the mixture; at the same time it is desirable to leave the compounder no loophole of escape as he is likely to excuse himself on the plea that the powder supplied has been impure. The test enables anyone to satisfy himself as to two important points, (1) the strength of the stock mixture, (2) the purity of the stock of quinine powder which is in use. It is, of course, essential to keep a vigilant eye on the stock of quinine powder as this also is liable to be tampered with.

The tests carried out by the senior writer in the Punjab and in Madras have disclosed a perfectly appalling state of affairs; they throw a flood of light on the supposed failure of quinine when given by the mouth and on the popularity of intramuscular injections. It is safe to say that cases of "*quinine* resistant" malaria are usually cases of "*compounder* resistant" malaria.

Another important point is that the administration of adulterated solutions has given an unfair advantage to the proprietary preparations of the cinchona alkaloids and also to the various substitutes for quinine which have been introduced.

In some local fund dispensaries quinine is handicapped in another surprising way: the yearly allotment for drugs is divided into twelve equal parts and each of these parts has to last for a month. The result of this astonishing procedure is that patients receive much smaller doses of quinine in the malarious season than in the healthy months. It would be incredible that such a practice should exist, were it not that several doctors have frankly admitted that they have followed it for many years.

It is not an exaggeration to assert that if it is possible to ensure that every patient gets the quantity of quinine which is ordered for him by the doctor a revolution will be brought about in the efficiency of our hospitals and dispensaries.

Test for Iodide Mixtures.

Encouraged by the valuable help derived from the rough quantitative test for quinine the senior writer asked Mr. Hawley to work out a similar test for potassium iodide mixtures. This test is carried out on exactly similar lines to the quinine test.

Reagent.

Powdered lead nitrate crystals	..	5 grammes.
Dilute nitric acid (B. P. 1914)	..	100 c.c.
Rectified spirit ..	..	200 c.c.

Dissolve the lead nitrate in the dilute nitric acid and then add the rectified spirit.

Method.

When dealing with solutions of 10 grains to the ounce proceed as follows:—

To each of two long narrow test tubes of equal calibre add the same quantity of the reagent (2 to 3 c.c.); to one of the tubes add 1 to 1½ c.c. of a control solution of potassium iodide made up to ten grains to the ounce; to the other add exactly the same quantity of the solution which is being examined. Mix well by slowly

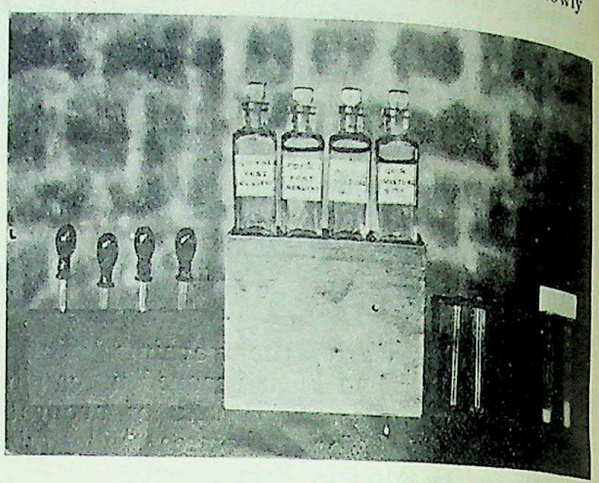


FIG. III.

One form of test case with the contents removed. The bottles hold one ounce.
The arrangement shown in Figs. I and II is handier and more compact.

inverting both tubes several times. Compare the volumes of the precipitates after ten minutes. As in the case of the quinine solutions, the exact quantities of the solutions which are used do not matter, provided that the correct proportions are maintained and that the tubes are of equal calibre. In the case of a solution of five grains to the ounce, equal quantities of the mixture and of the reagent should be used and the control solution should be first diluted with an equal quantity of water. The purity of the potassium iodide from which the stock dispensary mixture was made can be controlled in the same way as the strength of the quinine powders. As potassium iodide is a costly drug it is likely to be tampered with in the same way as quinine. These simple tests can easily be carried out by any inspecting officer, they will serve as useful controls on the nefarious activities of certain compounders.

The illustrations show a handy outfit which has been devised by the writers: it is hoped that some manufacturing firms will construct still more convenient test cases and that these will be used by all inspecting medical officers, especially during surprise visits.

MYIASIS IN LEPERS.

By G. R. RAO, D.M.C. (Madras), D.T.M. (Bengal),

Medical Officer, Leper Asylum, Cuttack.

A CASE of nasal myiasis in a leper, with peculiar symptoms, was reported by me in the April 1928 number of the *Indian Medical Gazette*. Since then I have had the opportunity of studying the occurrence of this condition in three more cases. As the study of these cases has brought out some interesting facts regarding the method of infection and as the subject is likely to attract the attention of others who have to deal with a large leper population, especially advanced cases in asylums and segregation colonies, I offer no apology for bringing this short note to the notice of the profession.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Brief clinical histories of the three cases, are given below:—

(*i*) *Saiti Behera*, male, age 55, B_3—A_2 case of leprosy suddenly noticed an alarming œdema of his whole face on the morning of the 3rd January, 1929. The previous night he was all right except for a little bleeding from his nose. Guided by the previous case, I diagnosed this case as one of "myiasis of the nasal cavities," and examined his nose. A foul smelling sanious discharge was present. As usual, his nose was irrigated with 1 in 80 carbolic lotion and a few dead maggots were recovered. The irrigation was repeated after 6 hours. Next day, a few living larvæ were brought out by gentle scraping with a small-sized Volkmann's spoon. These larvæ were bred with the greatest difficulty and only one reached the imaginal stage. The adult was found to be *M. domestica*.

It is difficult to say why the larvæ recovered from cases of myiasis do not live long. Most of them die after three or four hours. The use of carbolic lotion was thought to be the cause of the poor longevity of the larvæ. So an attempt was made on the next day with saline, and even then very few of them survived up to the adult stage. Possibly, these larvæ after having fed on human tissues find it difficult to live on moistened cowdung powder, the only medium supplied to them.

This case was treated throughout with the same 1 in 80 carbolic lotion, douching twice a day, for 7 days. The swelling of the face began to subside on the 2nd day, and on the 4th day his nose was found to be considerably flattened, the swelling having come down. A hole admitting a silver grooved director was also found in the middle line of the nose just midway between the root and the tip of the nose. This hole is still present. On the 5th day the nose was examined and healing ulcers were found, especially in the region of the inferior nasal concha.

(*ii*) *Debananda Panigrahi*, male, age 52, an A_2 case of leprosy, had several perforating ulcers on his hands and feet, besides a few blisters. On my usual morning rounds, on 5th January, 1929, I found him with œdematous legs, arms and feet. All the ulcers were found to have undermined edges. On searching with a probe, just underneath the edges, a few dead larvæ were found. The edges were clipped all around, so as to facilitate the extraction of the larvæ from underneath the skin. With a little persistence, numerous larvæ were extracted from beneath the edges of all the wounds. Of course a certain amount of bleeding occurred. After thorough irrigation with carbolic lotion, the wounds were examined and several radiating sinuses were found around each wound. It was very difficult to deal with these sinuses; some were slit up so that they could be more effectively dealt with. In this case also only a few living larvæ could be recovered and the adults were identified to be of the genus *Sarcophagus*.

Excision of the undermined edges when necessary, slitting up of all the deep sinuses, and irrigation with 1 in 80 carbolic lotion—these were the lines of treatment adopted. After 4 days, the wounds became clean, and very few larvæ could be found. On the 5th day, the patient died suddenly of cardiac failure.

(*iii*) *Bancha Setti*, male, age 45, a B_3—A_2 case of leprosy, has several ulcers all over the body—the result of breaking down of the nodules. He is a particularly lazy and filthy patient. Considerable swelling of the limbs and especially of the margins of the ulcers was found. This swelling came on rather suddenly. Thorough cleaning of the wounds and exploration of the undermined edges revealed the presence of numerous dipterous larvæ underneath the skin. Excision of the undermined edges, slitting open the several sinuses and irrigation with 1 in 80 carbolic lotion were the usual lines of treatment adopted in this case too. But as there was a heavy infestation in this case warm potassium permanganate baths were also ordered in addition. As both the limbs—upper and lower—were affected, they were given the bath alternately. The duration of the bath was one hour for each limb. Immediately after the bath, the wounds were dried and dressed with E. C. (Electrolytic Chlorogen) soaked gauze and bandaged.

A few living larvæ were recovered from this case. After breeding, the adults were found to be *M. domestica* and a few *Sarcophagus* adults were also present. It is surprising to find the larvæ of both *M. domestica* and *Sarcophagus* growing together in the same patient.

The patient is making a slow recovery; but a wound on the dorsum of the right elbow joint has been heavily infested and consequently the joint is exposed, bare bones are visible. To prevent the onset of secondary infections in the bones, this wound is treated with continuous application of E. C. (strength 1 in 25).

A study of these cases brings out the following facts:—

(*i*) In cases of nasal myiasis, the first symptom to attract the attention of the patient as well as that of the physician is the occurrence of epistaxis—followed by sudden swelling of the face. In these cases, careful examination will reveal the presence of several dirty ulcers in the nasal cavities.

(*ii*) Foul smelling ulcers inside the nose, with their offensive discharges, provide an attractive pabulum for the flies. During sleep flies seem to enter the nose and deposit their eggs in the ulcers. These eggs, having got the necessary conditions of environment, viz., warmth, moisture, etc., inside the nose, begin to develop into larvæ. This seems to be the natural mode of infection.

There is no possibility of the larvæ directly crawling up into the nasal cavities during sleep, as in that case patients would be likely to give a history of some worms having entered their noses. But my careful enquiries did not elicit any such history. Further, the number of larvæ found in a case is against this possibility, as no large number of larvæ could get into the nose of even the most stupid patient without making him feel the entrance of foreign bodies.

When these newly hatched larvæ begin to burrow into the tissues, the patient feels an irritating sensation inside the nose and a certain amount of bleeding occurs. The sudden occurrence of œdema is probably due to effusion under the subcutaneous tissues of a serous fluid—the result of the burrowing action of the larvæ injuring the deeper tissues.

(*iii*) So far, only larvæ of *M. domestica* have been found infesting the nasal cavities of lepers in this asylum.

(*iv*) Open wounds in lazy, filthy and helpless patients attract the flies. In patients who move about and keep themselves active during the day, and sleep at night, covering their faces or rather their entire bodies no myiasis has occurred even in open wounds. If the wounds are dressed every day, and bandaged, no myiasis could occur. In B_3 cases, when the nodules break down and form ulcers, especially in weak and helpless patients, every small wound in the skin should be bandaged or closed with strips of adhesive plaster, so that flies may not have any opportunity to deposit their eggs into the wounds. *Sarcophagus* flies seem to be specially attracted by the open wounds of lepers.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*v*) When open wounds are infested, especially those on the limbs, the treatment becomes very difficult and tedious, as the loose integuments of the extremities offer special advantages to the burrowing larvæ. As the larvæ are found beneath the skin around the wounds—specially underneath the edges—the edges should be excised and a few radiating incisions should be made around each wound, to have free access to the deep lying larvæ and to secure their expulsion. By these radiating incisions the numerous false passages created by the burrowing larvæ may be laid open and then only can these sinuses be satisfactorily dealt with. Each wound should be thoroughly explored as no larvæ may be found superficially. Irrigation with 1 in 80 carbolic or 1 in 25 E. C. is quite enough for cases of mild or moderate degree of infection. In severe cases warm potassium permanganate baths for the affected parts may be given in addition.

(*vi*) The great difficulty of recovering living larvæ or viable larvæ from the tissues should be noted; and the still greater difficulty of successfully breeding the few living and viable larvæ that could be extracted up to the adult stage is also worthy of attention. Gentle scraping with a small-sized Volkmann's spoon aided by irrigation with warm saline seems to be the best method of recovering living and viable larvæ.

(*vii*) The problem of prevention presents some difficulties, especially in the case of nasal infections. As for open wounds, closing them with bandages or strips of adhesive plaster is the best method of prevention. But obviously the nasal cavities cannot be dealt with in this way.

In all B_3 cases, especially in the old lazy and filthy patients who never move about, the nasal cavities may be painted with Hydnocreol twice a day, once in the morning and once at night, before going to bed. This method is under trial at present. Also the patients should be advised to cover up their faces when they sleep—whether during the night or the day.

Lastly, cleanliness of the person and the clothing is of great importance in the prophylaxis of myiasis, as in other diseases.

A PRELIMINARY NOTE ON A COLOUR REACTION FOR "693" AND ITS APPLICATION IN THE ESTIMATION OF THAT COMPOUND IN THE URINE.

By T. C. BOYD, F.R.C.S.I., D.P.H., F.I.C.,
LIEUTENANT-COLONEL, I.M.S.,
Chemical Examiner to the Government of Bengal,
and
A. C. ROY, M.SC.,
Biochemical Research Worker under the Indian Research Fund Association.

WE have been experimenting on a suitable colour reaction for compounds like Bayer's 693 (diethyl amine p-amino phenyl stibinate) used in the treatment of kala-azar, by means of which we could follow by a simple method the course of antimony excretion in the urine instead of depending upon the long and tedious process of antimony estimation by the methods commonly employed.

We found that on diazotising a solution of "693" with dilute hydrochloric acid and sodium nitrate solution and coupling it with α-naphthol in alkaline solution a fine red colour was produced and the depth of this colour was proportional to the concentration of the antimony compound in the solution.

After many trials the following procedure was found to give the best colour effect.

To 0.5 c.c. or more of the solution, depending upon the concentration of the compound, 1 drop of dilute hydrochloric acid was added, then 1.5 c.c. of water and the mixture cooled in ice. After about 10 minutes 1 drop of a 1 per cent. solution of sodium nitrite was added, mixed and the test tube again put back in ice for about a minute. Then 1 c.c. of about 1 per cent. solution of α-naphthol in 20 per cent. caustic soda was added and mixed. The colour formed was allowed to develop for about 5 minutes and compared against a standard solution of the substance treated in the same way.

The lowest limit for the formation of a distinct red coloration for "693" is about 0.02 mg. in 0.2 c.c. of the solution.

Urea stibamine also gives a colour reaction on similar treatment but the limit of distinct red coloration in this case is about 0.5 mg. in 0.5 c.c. of the solution.

In the case of urine from a patient treated with "693", a known volume of the urine is treated exactly in the manner described above and compared against a known volume of a standard solution made by dissolving a known weight of "693" in normal urine similarly treated. Usually a 1 in 10,000 solution is used. The colour developed is best compared in a test-tube colorimeter.

Further experiments are in progress and we hope to be able to publish a detailed account of our work shortly.

A Mirror of Hospital Practice.

A CASE OF INDUCED POLY-LEUCOCYTHÆMIA.

By L. EVERARD NAPIER, M.R.C.S., L.R.C.P.,
and
K. C. HALDAR, L.M.P.,
From the Kala-azar Research Laboratory, Calcutta School of Tropical Medicine and Hygiene.

WHEN the observations on this case were made it was not our intention to publish them, but as the case exhibits some unusual features we have

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

subsequently decided to publish our notes, incomplete as they are.

The patient was a Hindu male, aged 28 years, a resident of a village near Calcutta. He gave a history of fever for eight months with progressive enlargement of the spleen. The fever was at first intermittent with rigors and was diagnosed as malaria, but quinine is said to have had little action.

The patient was thin and slightly anæmic. His spleen was 7½ inches below the costal margin, and was firm and not tender. His weight was 74 lbs. He was suffering from a high remittent type of fever, showing a single rise and fall during the 24 hours. The pulse rate was 100 per minute.

Leishmania were found in the peripheral blood: the total white cell count was 3,980 per c.mm. and hæmoglobin percentage 70.

We were apparently dealing with a very ordinary type of kala-azar. The patient was given 8 injections of neostibosan at intervals of 48 hours, so that the treatment was completed in 15 days. As the fever continued up to the end of the second week of treatment, cinchona febrifuge (grs. 10) was given twice daily. After this the temperature fell to normal, and he had no return of fever throughout his stay in hospital. Twelve days after the completion of the course of treatment a routine blood count was done. The total white cells had increased to 9,440 per c.mm.; this was about the usual increase that is expected in such a case. The next routine blood count, which was done after another twelve days interval, showed that the white cells had increased to 25,625 per c.mm.; this was an unusually high count and made us decide to keep the patient under observation for as long a period as possible. Blood counts were done at frequent intervals. Circumstances did not always permit of a differential count being done at the time the total count was done, but blood films were usually taken and kept for subsequent counting. Unluckily some of the blood films were mislaid, so that this part of the report is not complete.

Throughout his stay in hospital the patient increased in weight and at the time of discharge was 96½ lbs., or 22½ lbs. more than at the time of admission.

No change at all in the size of the spleen was noticeable; it was enlarged 7 inches below the costal margin at the time of discharge, whereas on admission it had been noted as being 7½ inches below the costal margin.

The Blood Counts.—The white blood counts at different dates are shown in Table I, and the differential counts, on the 5 occasions on which they were done, in Table II. On the chart the total white cell counts have been plotted and a graph drawn. In the case of the polymorphonuclears, the myelocytes and the small lymphocytes the points have been plotted, but the complete graph has not been drawn as no differential count

TABLE I.

Serial number.	Day of observation.	Date.	W. B. C. per c.mm.	Hæmoglobin.
1	2	6-10-28	3,980	70%
2	29	2-11-28	9,440	75%
3	41	14-11-28	25,625	75%
4	57	30-11-28	39,760	85%
5	64	7-12-28	48,400	80%
6	71	14-12-28	67,435	90%
7	78	21-12-28	144,375	90%
8	92	4-1-29	88,000	85%
9	99	11-1-29	70,800	75%
10	106	18-1-29	29,760	75%
11	113	25-1-29	31,600	80%

was done on the day when the total count reached its highest point. These incomplete graphs indicate what would have been the general direction of the graphs had the differential counts been done on each occasion that a total count was done.

Technique.—All the total counts and the first differential count were done by the junior writer. For the total counts he used the Thoma-Zeiss counting chamber and diluting pipette. The blood was diluted 20 times and 20 fields of 50 squares each were counted. For the differential counts the senior writer used his (1922) small film method, i.e., a very small smear is made and every leucocyte on the slide is counted. At least 250 cells were counted each time. The hæmoglobin was estimated by means of a Tallqvist scale.

The Total Leucocyte Count.—At first this rose slowly, later more sharply and then, during the sixth week after treatment had been completed, it suddenly shot up to 144,375 per c.mm.; it fell with equal rapidity to the 30,000 mark, where it remained until the patient was discharged.

The Differential Count.—Up to the 41st day the rise in the total count was mainly due to the rise in the polymorphonuclears, although there was also a distinct rise in the large hyalines and transitionals. Subsequently the rise in the total count was mainly brought about by the myelocytes. The small lymphocytes were almost constant

TABLE II.

	Day of observation.				
	29th	41st	64th	71st	113th
Polymorphonuclears	5,853	12,915	23,232	26,165	19,592
Lymphocytes	1,699	1,435	2,517	2,697	1,517
Large hyalines		4,920	5,034	7,283	5,814
Transitionals		4,408	3,291	4,316	3,160
Türk's irritation forms	1,699	718	..	..	..
Myelocytes		718	13,939	25,356	1,517
Eosinophiles	189	..	387	1,618	..
Mast cells	..	513	..	..	..
TOTAL WHITE CELLS	9,440	25,627	48,400	67,435	31,600

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

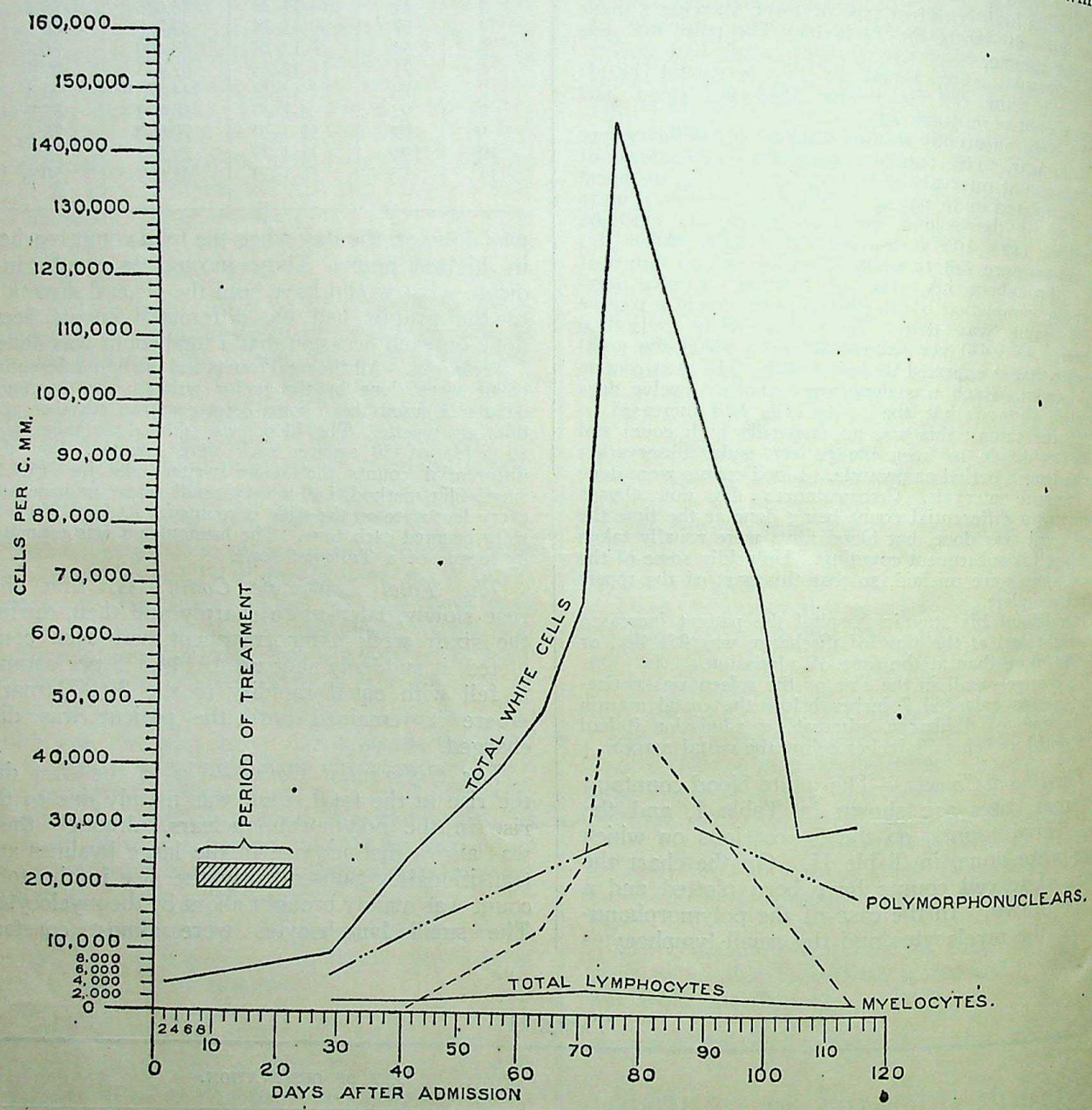
throughout, and, after an initial rise, so also were the hyalines and transitionals.

The Red-Cell Count.—This is not done as a routine measure as there is seldom much change in kala-azar; the count is usually about 4,000,000 per c.mm. on admission, improving to 4,500,000 or even 5,000,000 at the time of discharge. In this case the hæmoglobin percentage, which is usually a very good indication of the red cell count, was estimated from time to time; the results are given in Table I.

Parasitological Investigation.—The parasites, *Leishmania donovani,* were found in his peripheral blood before admission. On the 28th day, that is 13 days after the conclusion of treatment, a spleen puncture was done; no parasites were found in the direct smear, but a culture showed that leishmania, were still present. A spleen puncture was done again on the 56th day; this time the culture was sterile. This delayed disappearance of the parasites is quite frequently observed in ordinary cases of kala-azar.

Discussion.—Myelosplenic leukæmia is far from uncommon in Bengal. Some of the patients with this condition have given a history of having received treatment for kala-azar, but, as an enlarged spleen is considered by some practitioners as a sufficient excuse for the administration of antimony, we have not always accepted this as evidence of a kala-azar attack. Kala-azar is a disease of the reticulo-endothelial system which is closely associated with the hæmopoietic system. One of the characteristic features of the disease is a leucopœnia; this is most noticeable in the polymorphonuclear element. The effect of treatment is to bring the leucocyte count back to normal. It has not been our practice to keep patients for long under observation when once the treatment has been completed, but in this instance certain other investigations were being made so that the rapidly increasing leucocytosis was more or less accidentally observed.

One, therefore, wonders whether this sequence of events does not occur quite frequently and



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

whether perhaps it should not be considered as one of the sequelæ of kala-azar, either of the disease itself, or of the antimony treatment. On the other hand, this may have been a case of myelosplenic leukæmia in which the condition was temporarily overshadowed by the superimposed leishmania infection, and that when the effects of the leishmania infection disappeared the other condition again became apparent.

The only way that this patient differed clinically from an ordinary case of kala-azar undergoing cure was that there was never any reduction in the size of his spleen.

REFERENCE.

Napier, L. E. (1922). The differential blood count. *Indian Med. Gaz.*, Vol. LVII, p. 176.

(*Postscript.*—A letter was received from this patient on 20th June, 1929; in this he stated that he was in good health, had had no return of fever, but that his spleen was still enlarged.—L. E. N.)

A CASE OF FREE BILE IN THE PERITONEAL CAVITY.

By A. HAMEED SIDDIQI, B.SC., M.B., B.S.,
Senior House Surgeon,
King George's Hospital, Lucknow.

DR. S. D. D., aged 33 years, was admitted to the King George's Hospital on the 27th October, 1928, with the complaint of diffuse pain over the epigastric, right hypochondriac and right lumbar regions of four months' duration.

A vague tender swelling was palpable in the right hypochondriac region for about one month. It was smooth and with the patient lying flat was felt about 1½ inches below the costal margin, about one inch to the right of median line. Percussion showed it to be continuous with the liver. The patient was weak and emaciated. No history of jaundice could be obtained, nor was it present on admission.

Before joining our hospital the patient consulted various surgeons in the military hospitals to which he was attached. All were of opinion that it was a case of cholilithiasis with adhesions:—

Notes on Pathological Examination.

Urine.—Nothing abnormal save the presence of triple phosphates. No bile.

Blood.—

Total W. B. C. count	..	10,240 per c.mm.
Polymorphonuclears	..	61 per cent.
Lymphocytes	..	38 per cent.
Large mononuclears	..	1 per cent.

Stools.—No ova or cysts of any parasites.

Wassermann reaction.—Completely negative.

Van Den Berg's Reaction.—Immediate direct, completely negative; delayed direct, negative; indirect, faintly positive.

The patient, while the above investigations were being carried out, was treated symptomatically. The most distressing feature was pain, which prevented sleep. Different hypnotics, i.e., paraldehyde, bromide and veronal, were in turn tried and found fruitless. Morphia, given every night, had the best result.

Diet.—He was practically being starved, as he was unable to retain the smallest quantity of anything.

An exploratory laparotomy was done on the 6th November, 1928. A right paramedian supra-umbilical incision was made for about 4 inches. As soon as a nick was made in the peritoneum, pure bile started flowing, and it was thought that probably an adherent gall-bladder had been opened. Bile continued to flow until about a pint and a half had come out. The peritoneal opening was enlarged and the peritoneal cavity was carefully looked into. The gall-bladder was found to be normal in size and position. A tumour was found behind the gall-bladder on the inferior surface of liver of about the size of an orange and nodular infiltrations could be felt in the great omentum as well. Evidently it was a case of carcinoma; a piece of infiltrated omental tissue was removed for pathological examination.

The patient's condition did not allow the investigation of the source of leaking bile. The inner surface of the peritoneum was abnormally pinkish in colour and was remarkably free from any adhesions. The general peritoneal cavity was closed with a drainage tube inside.

Pathological Examination.

Tissue.—Colloid cancer.

Fluid.—Bile, chemically.

Culture.—Negative.

The drainage tube was removed after 24 hours.

9th November, 1928.—Patient's conjunctiva showed slight yellow colouration.

11th November, 1928.—Definitely jaundiced.

12th November, 1928.—Patient's sputum was blood stained and remained so throughout the rest of his days.

15th November, 1928.—Stitches were removed; wound healed by first intention. Skin on the abdomen showed yellow discolouration.

19th November, 1928.—Patient was discharged from the hospital at his own request, and left the same day for Lahore.

23rd November, 1928.—Patient died at Lahore.

There are two points which are of especial interest in this case.

(1) Late appearance of jaundice in an established case of carcinoma of the liver.

(2) Presence of free bile in the general peritoneal cavity for a length of time.

My thanks are due to Captain M. S. Nigam for allowing me to quote his case.

A CASE OF ECTOPIC GESTATION.

By AGHORE NATH GHOSH,
Officiating Civil Surgeon, Tippera.

A FEMALE, aged 28 years, married at the age of 15, nullipara, was admitted to the Comilla Sadar Hospital on 4th November, 1927, with an abdominal tumour. She gave the following history:—

In February, 1923 her menstruation ceased and all the signs of pregnancy became evident. When she thought that she was about 3 months pregnant, she felt a sudden severe pain one night; the pain simulated labour pains but there was no bleeding, she says, from the uterus. However, the pain subsided, but she became very weak and prostrated. When the pregnancy advanced to the 7th month, she lost consciousness for several minutes one night after a sudden attack of excruciating pain. She felt as if something had given way inside; but with this attack there was a little bleeding from the uterus. A week after she had another attack of pain in the lower abdomen. This pain was, however, not severe and with this the menstruation began and lasted for 4 days, the quantity of blood lost being a little more than usual. Then almost every 5th or 6th month she used to get severe pain on the left side of the lower abdomen, generally proceeding the menstrual period which was regular, but sometimes independent of it. The pain however had become more frequent during the last 2 years and for the last two months almost constant.

Menstrual History.—Her periods began at the age of 15. From that time up to 1923 she was regular; sometimes the period lasted more than 4 days, but she never missed a period.

Previous History.—She was of indifferent health all along and about 12 years ago she had tuberculosis of the bones of right foot for which she was treated for 6 or 7 years. Her husband had an attack of gonorrhœa immediately before the marriage and she contracted the disease. There was no history of abortion.

State on admission.—She was rather pale and emaciated but there was no marked anæmia. An irregular very hard and knobby tumour, about 3 inches by 1½ inches, was found on the left side of the lower abdomen. On palpation the feeling was not unlike that of a bony tumour. The tumour was not very painful on pressure.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The uterus, on vaginal examination was less movable than normal, especially on the left side, but it was not enlarged.

From the history of gonorrhœa, of pregnancy, of attacks of severe pain with faintness, of regular menstruation till the beginning of the present illness and from the peculiar feel of the tumour, a provisional diagnosis of extra-uterine gestation (abdominal pregnancy) was made.

On 7th November, 1927, the abdomen was opened, in the usual way, by Rai Bahadur J. N. Mitra, Civil Surgeon. On opening the peritoneal cavity a shrivelled-up fœtus of about five months was found almost free in the lower part of the peritoneal cavity, there being only 3 or 4 strips of narrow long bands connecting the fœtus with the left broad ligament and part of omentum. These bands which did not contain any vessel were cut and the fœtus was taken out without any difficulty. Another tumour, formed from the gestation sac, was found adherent to the omentum, the broad ligament and the left tube (which looked like an adherent loop of small intestine). This tumour was dissected off without much hæmorrhage. After the usual toilet the abdominal cavity was closed in three layers.

The patient made an uneventful recovery and was discharged from the hospital on 25th November, 1927.

A CASE OF MYIASIS OF A CARIOUS TOOTH.

By C. STRICKLAND, M.A., M.D.,
Professor of Medical Entomology,
School of Tropical Medicine, Calcutta.

THIS case was seen first by Dr. Chakrabarty, Assistant Surgeon on Ambutia Tea Estate, Kurseong, who showed it to me.

The patient was a Nepali woman, aged 52, a tea-garden cooly, particularly strong and healthy.

She complained of toothache.

On examination the left 2nd upper molar was found extensively carious, all the other teeth being in excellent condition. There was no alveolar trouble near the affected tooth, or elsewhere.

On proceeding to clear the carious cavity with a pledget of cotton wool on a probe, about a dozen maggots emerged and were collected. The cavity after cleaning and dressing was plugged with cotton wool and when the pain had disappeared the tooth was extracted and no further trouble ensued.

Dental myiasis has I believe never been reported before. Presumably a fly being attracted by the odour of putrefaction arising from the tooth had seized the opportunity of depositing its eggs *in situ* during the patient's sleep with her mouth open, and the maggots subsequently developed and caused the trouble.

I identified the maggots as those of *Chrysomyia bezziana*, one of the common "green bottle" flies of India, a diagnosis which Colonel Patton very kindly confirmed for me, agreeing also that this was an unique occurrence.

AN OBSCURE NEUROLOGICAL CASE SIMULATING EARLY LEPROSY.

By E. MUIR, M.D., F.R.C.S. (Edin.),
Research Worker in Leprosy at the School of Tropical Medicine and Hygiene, Calcutta, under the Indian Research Fund Association,
and
JOHN M. HENDERSON, M.B., Ch.B. (Glas.),
Working under the British Empire Leprosy Relief Association at the School of Tropical Medicine and Hygiene, Calcutta.

J. S., æt, 30 years, a young Cinghalese medical man, presented himself at the Leprosy Research Department of the School of Tropical Medicine and Hygiene, Calcutta, complaining of loss of sensation in the skin of the lower right eyelid and right side of the nose of between 6 and 9 months' duration. About 9 months ago the patient became conscious of defective sensation in the skin of the lower right eyelid and upper part of the right cheek; 3 months later the condition had spread to the skin of the right side of the nose. After a further period of roughly 3 months, a sensation of numbness of the right side of the palate was noticed.

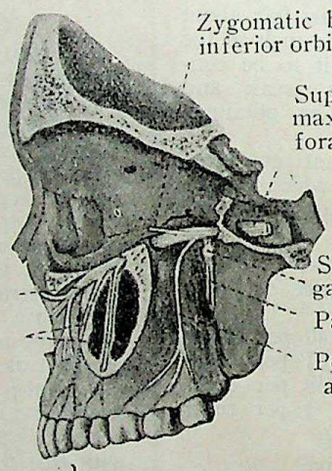


Fig. 1.
(After Cunningham.)

Previous History.—The patient had sycosis barbæ in 1922. In 1923, while stationed in Madras City, he suffered from benign tertian malaria; to the best of the patient's belief this infection was a pure benign tertian. Fever recurred intermittently until 1926 and finally yielded to intravenous quinine therapy. No history of venereal disease was obtained.

Present Condition.—There is anæsthesia to light touch involving the right lower eyelid and upper part of the right cheek, the right side of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the nose in its lower half, the right nasal fossa, the right half of the palate (hard and soft) and the alveolar margin on the same side. No other abnormality can be detected on physical examination. The teeth are sound and there is no apparent lesion of the ears, eyes or throat. The Wassermann reaction is negative. The patient has been stationed in Upper Burma for the past 3½ years.

Report on X-ray Examination of the Skull.—"The skiagram shows (1) marked opacity in the sphenoidal sinus, (2) a curious extension downwards of the frontal sinus into the infundibulum, (3) some unusual opacity anterior to the sphenoidal sinus."

Discussion.—The unusual distribution of the anæsthesia together with complete absence of other signs of that disease makes a diagnosis of leprosy extremely improbable. Lesions of the nose are not uncommon in leprosy; such lesions are rather protean in their manifestations and vary from a dry rhinitis with crust formation to nodulation and ulceration. In the case under report the nasal mucosa, except for the presence of anæsthesia in the right anterior fossa, looked perfectly normal. Leprous lesions of the palate are less common; in our experience they take the form of diffuse granulomatous or nodular lesions and occur only when there are gross and obvious signs of the disease elsewhere.

It will be noted (Fig. 1), that the anæsthesia corresponds with the anatomical distribution of the superior maxillary branch of the fifth cranial nerve. Sensation is supplied to the palate by the palatine nerves which are derived from the superior maxillary division of the trigeminal nerve, *via* the spheno-palatine (Meckel's) ganglion. In this case, therefore, there is interference with the function of the superior maxillary division of the trigeminal nerve at some point between its origin from the semilunar (Gasserian) ganglion and its association with Meckel's ganglion in the spheno-maxillary fossa. The nature of the interference is at the moment obscure; the negative Wassermann result diminishes the possibility of syphilitic infection. In malaria, neuralgia is said to be of frequent occurrence especially in the ophthalmic and superior maxillary divisions of the fifth nerve, but we have not been able to find in the literature any reference to abolition of function of the superior maxillary branch of the trigeminal as a sequel to malaria. Moreover, in malaria organic nervous manifestations tend to come on abruptly, not slowly as in this case. The finding by *x*-ray examination of "marked opacity in the sphenoidal sinus" and of "some unusual opacity anterior to the sphenoidal sinus" seems to indicate a neoplasm; osteoma and osteo-sarcoma suggested themselves.

The patient has been referred to a surgical colleague who has prescribed deep *x*-ray therapy twice weekly for two months, and his further progress will be watched with considerable interest.

ACUTE AMŒBIC DYSENTERY TREATED BY *HEDYOTES AURICULARES*, N. O. RUBIACEÆ.

By CAPTAIN P. R. BHANDARKAR, L.M. & S.,
1|64, *Mint Street, Pt., Madras.*

S., male adult, age about 40, a Cutchi Jain, a clerk, living in Madras.

I was called to see the case at 8 a.m. on Thursday, 28th March, 1929.

History of the onset of disease.—On 24th March he had had four diarrhœic motions with griping during the night, followed by four or five similar loose motions during the day. During the night of the 25th he had 10 to 12 motions with mucus and blood; and on the 26th he had about 20 muco-sanguinous motions with severe griping tenesmus, for which the doctor, called in on the morning of the 27th, gave him a hypodermic injection, possibly emetine, and also a pinkish white mixture internally. He had about 20 motions during the day and more than 30 motions during the night of 27th with unbearable tenesmus in spite of the injection and medicine. The motion had been examined by Dr. Murugesan, Bacteriologist.

The patient had a temperature of 102.8 and an anxious expression.

Bacteriologist's report: Entamœbæ histolytica found in very large numbers, living and active ones.

I prescribed,

Liq. ext. hedyotes auriculares	..	℥ 1½
Tinct. opii.	..	min. 40
Syrup	..	℥i.
Aqam ad.	..	viii.

One-eighth part every four hours.

1st dose given at	10 a.m.	one motion.	
2nd dose „	12 noon	one motion.	
3rd dose „	4 p.m.	one motion.	
	7 p.m.	one motion, tenesmus reduced.	
4th dose „	8 p.m.	two motions before 10 p.m.	

The patient slept well till 2 a.m. 29th and had one motion, slept again and woke up at 4 a.m. and had two motions. 5th dose given at 7 a.m.—had a small motion with little blood and mucus, but more fæcal matter.

The motion he had at 12-30 p.m. was sent to the bacteriologist.

Bacteriologist's report.—A few amœba are seen here and there—all dead and disintegrating (granular in appearance). No living or active amœba seen in the specimen.

A 6th dose of the mixture was given in the evening of the 29th—had only two motions till next morning, the 30th when the patient passed a fully formed stool with blood streaks here and there. This was sent for examination and the 7th dose was given.

Bacteriologist's report.—One or two dead and dwindling away amœba seen here and there. A few cysts of amœbæ seen. Stools alkaline in reaction.

The patient's diet during the treatment was rice water, barley water, arrowroot congee, pomegranate juice and 50 per cent. diluted milk. He had been kept on whey water on the 27th.

ELECTRO-COAGULATION (SURGICAL DIATHERMY) IN MULTIPLE ANGIOMATA OF THE HEAD.

By P. P. LALVANI, L.C.P.S. (Bom.),
X-Ray Department, Civil Hospital, Karachi.

THE patient, a lady by name Sitabai, aged 40 years, resident of Karachi district, had for the last six years multiple angiomata over the left side of the head. They were situated over the temporal region, eyebrow and forehead, and extended as far as the anterior

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

three-fourths of the parietal region. They constituted a very extensive swelling and were all mixed together. At the fronto-parietal region the swelling assumed a size of a small orange. They were expansile and on palpation a distinct thrill could be felt. They were compressible by pressure, the swelling could be obliterated. The left eye was very nearly closed on account of pressure. The patient said that on two occasions she bled through them. On account of disfigurement and also of danger to life due to bleeding she sought treatment.

Photograph No. 1, (taken before the electro-coagulation) shows the condition described above. The case was seen by Lt.-Col. J. L. Lunham, I.M.S., acting Civil Surgeon, Karachi, in whose opinion the case was surgically inoperable and was therefore referred to me for surgical diathermy.

The tumour over the left temporal and frontal region was electro-coagulated at one sitting on 7th July, under chloroform. Two electro-coagulation needles connected to two poles of a diathermy machine were introduced through the growth, diametrically, via different ports of entry, and coagulation

Photograph No. 1.
Taken before electro-coagulation.

was brought about in the blood inside the tumour. During the process of electro-coagualtion, the heated blood was actually found bubbling. The punctures through which needles were introduced bled at some places as soon as they were withdrawn; this was stopped by means of a disc, or a button electrode. On the 7th day after electro-coagulation there was secondary hæmorrhage which was controlled. The resulting slough came off in about two weeks leaving a clean ulcer.

The remaining portion of the tumour was electro-coagulated at the second sitting about three weeks after the first one, in the same manner. On the 5th day there was secondary hæmorrhage which was controlled. The entire slough came away in two weeks and the ulcer healed in about three weeks, and she was discharged cured on 2nd September.

Photograph No. 2 (taken at the time of discharge) shows the whole growth entirely removed and replaced by pliable scar tissue. The left eye, which was closed before the treatment, is now open.

Surgical operation on such an extensive angioma was thought inadvisable on account of the danger of bleeding. Besides, the scar tissue resulting from of a surgical operation would have caused a considerable amount of contraction and would very likely have resulted in ectropion of the left upper eyelid. But with diathermy the scar being very supple there is no such danger.

Photograph No. 2.
Taken after treatment.

I am grateful to Lt.-Col. J. L. Lunham, I.M.S., acting Civil Surgeon, Karachi, for his valuable advice and kind permission to publish this case.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail)

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones.

The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.

Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

OPOCRIN HEPAR.

Dose in Pernicious Anaemia 18 pills per day.

Special liver extract for Pernicious Anæmia, Antitoxic effects, to favour intracellular absorption of Glucose, and for diabetes when due to defective functioning of the liver.

Price, bottle of 50 pills Rs. 3.

For COUGHS whatever their origin

ONE GRAMME CREOSAL CONTAINS

Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY
P. O. Box 226, MADRAS.

Telegrams: "AMPSALVAS."

P. O. Box 7861, CALCUTTA.
P. O. Box 134, RANGOON

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

JULY.

THE NEED FOR A THERAPEUTIC SUBSTANCES ACT FOR INDIA.

WITH the rapid advance in the sciences of pharmacology and chemistry, the number of new drugs that are added each year to the pharmacopœia is very great and is increasing year by year. While many of the new drugs are extremely valuable to the physician, others are useless and some are actually harmful. In most countries there are regulations which exercise a rigid control over the nature and the quality of the drugs placed on the market, but in India no regulations exist, either to prevent the importation or the manufacture within the country of valueless or even harmful medicines.

During the last eight years a large number of both imported and locally-manufactured drugs have been tested in the pharmacological and chemical laboratories of the Calcutta School of Tropical Medicine and Hygiene; many of these have been found on biological assay to possess only a fraction of their claimed therapeutic activity or, in a few instances, to be totally inert, whereas in the case of others it has been found on chemical estimation that a greater portion of the alkaloid or other substance, which they were supposed to contain, has been replaced by some inactive material. Determination of the real quality or genuineness of drugs on the market is outside the scope of the general medical practitioner; he looks to the State for guidance and protection.

The climatic factor is an important one; high atmospheric temperature combined with high humidity accelerate deterioration during storage. Tinctures which when they leave England or the United States may be fully potent are frequently considerably below the pharmacopœial potency when they are given to the patient. Some years ago a number of samples of digitalis issued by well-known firms were tested and it was found that in nearly every instance 30 to 40 per cent. of deterioration had occurred. Most of the arsenicals of the salvarsan group undergo a slow chemical change during storage; this change, which is considerably accelerated in the Indian climate, not only decreases their efficacy but may increase their toxicity to a dangerous extent. In our last number we published a letter from one of the leading manufacturers in Germany warning the public against purchasing certain of their own preparations which had been condemned in Europe and which, they suspected, had been brought to India by unscrupulous importers.

In the United States of America, the Government controls the remedial agents by means of an inter-state (i.e., central) commerce clause of the constitution. Under this act the "Food and Drugs Act" is enforced by the Bureau of Chemistry of the Department of Agriculture, while the sale of biological products such as serums, vaccines, etc., is controlled by the Public Health Service. Not only is control exercised over all drugs, serums, etc., that are meant for home consumption, but all substances belonging to this class which are imported or exported are also governed by the Act. The Act is designed to secure truthful names and reliable statements for all the remedial agents and is divided into two parts.

Part I of the Act is concerned with patent medicines and drugs which are advertised mainly in the lay press and are usually purchased by the layman himself, and Part II applies to medicines ordinarily prescribed by physicians. This Act ensures that the purchaser, whether a physician or a layman, secures an honest product. It means that pharmacopœial preparations must come up to the standard laid down in the *United States Pharmacopœia*, failing which the manufacturers will be prosecuted. In the case of patent medicines, the law requires that only those claims should be made which can be substantiated, and in this way it controls exaggerated claims, and misleading and false advertisements. Standards are provided for most of the biological products. In the case of preparations for which tests of standards are incomplete, the samples are sent to the Government Laboratory with a copy of the records of the maker's tests, and these are repeated and the preparations are finally passed for sale or rejected. The toxicity of each batch of organic arsenical products is tested before it is allowed to be sold. No licence is granted to any firm until the licensing authority is satisfied that the personnel and equipment of the firm is qualitatively and quantitatively efficient for the purpose for which the licence is sought. In addition to this licensing system, samples of finished products are bought in the open market and are tested by officers of the Government with regard to their purity and potency. By these activities a constant control is kept over these drugs, and the postal authorities are responsible for the prevention of frauds and exploitation through the post. The powers of the postal authorities in this respect are shown by a recent occurrence. An individual was advertising a fraudulent specific; all letters addressed to him were opened at the post office and, if found to relate to this specific, were stamped "Fraudulent" and returned to the sender.

In the United Kingdom, until quite recently, the purity of food and drugs was dealt with by the "Sale of Food and Drugs Act of 1875" and the "Amending Act of 1879." These Acts make it an offence to sell to the prejudice of the buyer, food or drugs not of the nature, substance or quality demanded, or to mix or sell food and drugs with substances injurious to health. These Acts lay down no standard for either food or

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

drugs, provided the analyst's certificate states the nature and extent of the adulteration, but various regulations made under the Act define the standard of purity for milk and milk products. The *British Pharmacopœia*, which is an official publication under the Medical Acts of 1858 and 1862 "containing a list of medicines and the manner of preparing them, together with the true weight and measures by which they are to be prepared and mixed," although not a legal standard under the Food and Drugs Act, is as a matter of fact usually accepted as such, in that the court will usually admit as *prima facie* evidence that a drug should correspond with the description of it given in the *British Pharmacopœia*.

The "Therapeutic Substances Act" was introduced in 1925. This Act controls the quality and authenticity of such therapeutic substances as cannot be tested adequately by direct chemical methods. These are divided into three groups. Group I consists of biological products, such as vaccines, toxins and antiserums. Group II includes substances such as organic arsenicals and antimonials. Group III is formed of insulin and other gland products. The manufacture of these substances is carried out by properly licensed firms who conform to the standard of strength and purity laid down by an appointed committee.

In India, public health being a provincial subject, the question of adulteration of food and drugs has been left to provincial governments and local bodies. The Calcutta Municipal Act of 1923 makes it an offence to sell adulterated or impoverished drugs. The Bengal Food Adulteration Act of 1919 refers to foods only, as do most other provincial Food Adulteration Acts, with the exception of that of the Punjab which also includes drugs. In the Bengal Act standards are laid down for six notified foodstuffs, but in none of the Acts are there any legal standards for drugs. We are not aware of any prosecutions under the Drugs Sections of these Acts having been instituted; the difficult question of standards would at once arise and local bodies are not likely to take the trouble and bear the expenses of test cases. These Acts are therefore virtually dead letters as far as the control of drugs is concerned.

So that, for all practical purposes, with the exception of the Poisons Act, 1919, there are in India no laws which regulate the importing, manufacturing, advertising or selling to the public of therapeutic substances of any kind, potent or inert, benign or harmful. The time has perhaps not yet arrived when legislation could be introduced on American lines controlling the advertising and the sale of fraudulent specifics and patent medicines for which extravagant claims are made; the practitioners of the various systems of medicine would immediately demand that all the drugs not used by them should be placed under a ban and we should certainly demand that a number of drugs used in the indigenous systems that we have tested and found valueless should be proscribed. But we do consider that some legislation should be introduced with reference to drugs used in modern scientific medicine to protect, primarily, the patient, who is liable to be dosed with useless or dangerous drugs, secondarily, the doctor who has no guarantee that the patient will receive drugs of the nature and potency which he prescribed, and finally, the honest manufacturer or importer who at present is compelled to compete with unscrupulous opponents.

If laws are to be passed insisting on drugs being of a certain standard, the first step must be a decision on the matter of standards. The simplest method would be the introduction of an *Indian Pharmacopœia*. With the help of the British and American pharmacopœias this should not be a very difficult matter, but it will take time; meanwhile the *British Pharmacopœia* could be adopted as the standard.

The therapeutic substances for which legislation might be introduced fall into two classes: the imported, and the Indian-manufactured products.

Imported drugs and other therapeutic substances.—At the present time the great majority of the therapeutic substances used by practitioners of scientific medicine in India are imported. In most instances these are manufactured by reputable firms who employ a staff of chemists and pharmacologists, but as there is practically no control over imported drugs there is nothing to prevent inferior, useless and dangerous drugs being brought into the country. In most of the foreign countries from which drugs are imported there is a strict control of all drugs manufactured for home consumption, but in some of these countries this control is not extended to drugs made for export. Here the question of climate, referred to above, comes in; drugs which may be fully potent when they leave their factory may have lost much of their potency by the time they are landed in India.

Under the League of Nations' agreement the customs authorities are compelled to exercise control over certain narcotic drugs, and in addition they have the power to exclude and confiscate drugs whenever actual fraud can be proved, as in the case of drugs marked "B. P. standard" which fall below this standard. They have their chemical laboratories for testing these drugs, but they do not assay them biologically.

The powers and responsibilities of the customs authorities in this respect might be increased. It might not be practicable, nor even advisable, for them to set up their own laboratories for carrying out biological assays, but they could pick out samples from each batch and send them to some central laboratory. The problem with regard to imported therapeutic substances would not end here; during their voyage to India they are only subjected to adverse climatic conditions for a comparatively short time, but the time that elapses between their arrival in India and their consumption by the patient may be, and in most

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

cases certainly is, very much greater. Another method of checking imported drugs would be for government agents to purchase samples from retail dealers and to send them to be assayed. This measure would lead to a greater knowledge of the keeping properties of various drugs and other therapeutic substances, but by itself would achieve little else. The dealer's stock, which might be very small, could be confiscated, but, unless he is to be given some guidance in the matter, it would be unfair to penalise him further for purchasing what he honestly considered a potent drug. It would not be fair to penalise the manufacturer or the importer, who may have respectively prepared and landed in India a potent drug which, if kept under favourable conditions, would have retained its full potency for a number of years. One thing that could be done is to insist on each bottle or packet having stamped on it the date of manufacture, the date of arrival in India and the date up to which it may be expected to retain its full potency or a large percentage of its potency—the percentage being specified—if kept under reasonably satisfactory conditions. At the same time rules for the storage of therapeutic substances could be formulated. Thus, by systematic examination at the port of entry and by sampling the stocks of retail dealers, the responsibility could be placed and the right person penalised. The work of the customs authorities would not be as great as it at first appears. As we have said, the majority of the imported goods come from respectable firms who test their goods thoroughly before sending them out; the testing of such goods would be merely formal and would only have to be done from time to time.

Indian-manufactured therapeutic substances.—Many of the plants from which pharmacopœial tinctures are made grow in India and during recent years an increasing number of firms have been established for the manufacture of tinctures and other similar substances for use in India. The time may not be far hence when, instead of these raw materials being exported, we shall manufacture these drugs ourselves for export. Some of these firms are also manufacturing gland extracts, vaccines and serums, and others are preparing and placing on the market potent organic compounds of antimony for intravenous administration. At present few of these manufacturing firms have any arrangements for assaying and standardising the potency, or testing the toxicity of the drugs they make; this can usually only be done by biological methods and a trained staff is necessary. There is in existence no law to prevent these untested drugs being placed on the market, or to prevent different batches of a preparation of antimony, for example, which bear the same label varying from time to time both in composition and in toxicity, and always differing materially from the compound which they claim to be.

The manufacturers of therapeutic preparations should be compelled to hold a licence, which licence should only be given to those manufacturers who comply with certain regulations.

One of the principal conditions should be that they maintain a trained staff for testing and assaying the preparations which they place on the market. Government agents should be permitted at any time to enter the factory and take samples. At the same time samples would be collected from retail dealers as in the case of imported drugs, and, as the climatic conditions are as likely to cause the same deterioration in locally-made drugs as in imported ones, the same rules as to labelling and dating each packing would have to be applied. In the case of antimonials and of arsenicals, the relative toxicity and the percentage content of antimony or arsenic of each batch would have to be declared and some indication of their keeping properties given, so that the public would be safeguarded against high toxicity and gross variations in composition. It might be suggested that in the case of a small firm, who made perhaps only one drug, this would impose a great hardship. Provision could possibly be made for a small concern of this nature having their preparations standardised or tested in some government laboratory for a fee, but their preparations would be subsequently subjected to the same scrutiny as those of the larger manufacturer.

Without the introduction of any new and drastic laws a considerable amount of control of manufacturers of therapeutic preparations could be applied by means of the excise authorities; certain *bona fide* manufacturers are allowed the privilege of keeping "bonded" stores of alcohol. This privilege could be reserved for manufacturers who comply with the regulations. As alcohol is essential for the preparation of most therapeutic substances, the withdrawal of this privilege would be a very serious matter and would prevent them placing in the market any drugs, in the preparation of which alcohol is used, at a competitive price. However, it would be essential for the mechanism for sampling and testing the drugs to be in existence as a guide to the excise authorities, as otherwise this method would be open to abuse.

The introduction of legislation on the lines that have been suggested above is a matter for the central rather than for the provincial governments. The work of testing the drugs is outside the scope of any organisation at present in existence. It seems probable that neither the customs nor the excise authorities would care to undertake such specialised work, and it is certainly not within the scope of the provincial chemical examiners or of the public health laboratories, nor could it in any way be considered to be the work of the Medical Research Department. It would therefore be essential to set up a new organisation under the central government with a number of inspectors to collect the samples and a central laboratory where these could be tested. The central laboratory would have to be well equipped and staffed with well-trained men; a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

pharmacologist, a chemist and a biochemist would be necessary. It is obvious that the laboratory should be situated at one of India's three main ports of entry, and, as Calcutta is far ahead of the other two towns in the matter of local manufacture of pharmacological products, it is indicated as the most suitable site. Subsidiary laboratories could eventually be established at Bombay and Madras.

It is not essential that a full working scheme should be inaugurated immediately; in fact such a step would be inadvisable. It would be better to begin by including only a limited number of drugs, for example, digitalis, ergot and a few other galenicals, and the antimony and arsenic compounds. But it should be made possible for the number to be added to each year without the introduction of any further enactments. The growth of the necessary organisation will thus be gradual.

This scheme would certainly cost money, but we do not consider that there should be any difficulty in justifying this expenditure. It is a public health measure which sooner or later must be adopted, and it is a matter in which India is far behind all other countries of a similar standing. It is certain that the introduction of legislation on these lines would very shortly react favourably on the internal trade of the country. Many doctors feel that patriotism and perhaps economy are their only excuses for prescribing locally-made unstandardised products; this new measure would make both classes of drug equal in respect of standardisation, and it would then simply be a matter of individual preference or price as to which was used.

With regard to external trade, India cannot hope to compete in foreign markets under the present conditions, and, as so much of the raw material for the preparation of medicines is exported, it is obvious that her opportunities for foreign trade are considerable. If it were considered essential, no doubt the scheme could be made to pay its way by charging a small stamping duty on each package imported and a licensing fee for the local manufacturers, but we do not consider this at all desirable from many points of view.

The criticism which will be immediately levelled against this scheme is that it will further increase the cost of drugs used in "Western Medicine." We are by no means certain that this will be the case. It will certainly stop the sale of extremely cheap goods in which the cheapness is only apparent; the drugs having been heavily adulterated are really more expensive than the pure product. It is, for example, not cheap to buy a 5-grain quinine tablet which only contains one grain of the alkaloid, even if it is half the price of the genuine article, and an inert drug is not cheap whatever the cost.

Corrigendum.

In the May, 1929 issue of the *Gazette*, p. 253, third line from bottom, in the left hand column "1|10ths c.c." should read "100ths c.c."

Medical News.

THE BRITISH EMPIRE CANCER CAMPAIGN. THE GARTON PRIZE AND MEDAL.

THE very valuable work which the British Empire Cancer Campaign has carried out for many years in investigating the ætiology and prevention of cancer must be well known to our readers. The Garton Prize and Medal which has recently been instituted by the Grand Council of the Campaign will be of interest to many of our readers. Particulars with regard to it are as follows:—

THE GARTON PRIZE AND MEDAL.

Particulars of Rules and Regulations to which all candidates must subscribe.

The Prize and Medal has been instituted by the Grand Council of the British Empire Cancer Campaign with the object of promoting investigations into the nature, causes, prevention and treatment of cancer.

A Medal (suitably inscribed and engraved with the seal and motto of the Campaign), together with an honorarium of £500, will be awarded to the person, or group of persons who shall submit the essay embodying the results of original investigations which, in the opinion of the Judges, appointed by the Grand Council of the British Empire Cancer Campaign, is the best contribution towards the *EARLY DIAGNOSIS OF CANCER.*

In the event of several dissertations of sufficient merit being submitted, the Prize may be divided, or additional awards made.

The Prize will be reserved if, in the opinion of the Council, no dissertation of sufficient merit be received.

Candidates, who may be of either sex, must be *British subjects domiciled in the British Empire or Dominions* and not at the time members of the Grand Council of the British Empire Cancer Campaign.

The honorarium may be awarded either to an individual or to a group of persons who jointly submit a dissertation.

The dissertations shall be printed or typewritten in English, and embody the results of original investigations carried out, either wholly or in part, during the three years immediately preceding the year in which the Prize shall be awarded.

The dissertations shall not bear the name of the author or authors, but shall be distinguished by a motto or device, and be accompanied by a sealed envelope containing the name and address of the author, and having on the outside the motto and device corresponding with that on the dissertation.

The dissertations shall be addressed to the Honorary Secretary, British Empire Cancer Campaign, 19, Berkeley Street, London, W.1, and be delivered not later than 31*st December*, 1931.

The Prize dissertation (with all accompanying illustrations and preparations) shall become the property of the British Empire Cancer Campaign, and shall be published at their discretion under the name of the author or authors.

Dissertations not approved for a Prize shall, upon authenticated application within three years of the award on the specified subject, be returned together with the unopened envelopes containing the names and addresses of the authors.

The award of the Garton Prize and Medal will be made early in 1932.

The British Journal of Actinotherapy and Physiotherapy.

THE March 1929 issue of this journal contains an interesting paper by Dr. Katheleen Vaughan,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

who has made a special study of osteomalacia as it occurs in Kashmir and elsewhere in India. This covers much the same ground as articles which we have published in this journal, for she attributes osteomalacia largely to light deficiency, and considers that the purdah system is responsible for its widespread incidence in India.

Other features of the same issue are a "Note on the Action of the Visible Rays" by Professor Leonard Hill, F.R.S., the well-known physiologist, and a discussion on the relief of pain by the intensive application of heat by Dr. J. Harvey Kellog. Other authoritative articles deal with the possibilities of luminous and infra-red rays in therapy, and the uses of diathermy.

The British Journal of Actinotherapy and Physiotherapy is a new journal which not only covers the field of actinotherapy but also all aspects of treatment by physical methods. It has a very strong advisory editorial board, including such well-known names as those of Professor Leonard Hill, Professor W. E. Dixon, Sir Henry Gauvain of Alton, Dr. Axel Reyn of the Finsen Institute, and Dr. Rollier of Leysin. The annual subscription to the journal is 17*s*. 4*d*. net. We are asked by the editors to state that specimen copies of the journal are available at 2*s*. from the publishers at 17, Featherstone Buildings, London, W.C. 1.

THE THIRD INTERNATIONAL CONGRESS OF THE WORLD LEAGUE FOR SEXUAL REFORM.

WE are asked to state that the Third International Congress of the World League for Sexual Reform will be held in London from the 9th to the 13th September, 1929. The League defines its chief objects as follows:—

(1) The political, economic and sexual equality of men and women.
(2) The liberation of marriage and divorce from Church and State control.
(3) The control of conception, so that procreation may be undertaken only deliberately, and with a due sense of responsibility.
(4) Race betterment by the application of a knowledge of eugenics.
(5) Protection of the unmarried mother and the illegitimate child.
(6) A rational attitude towards sexually abnormal persons.
(7) The prevention of prostitution and venereal disease.
(8) Disturbances of the sexual impulse to be regarded as more or less pathological phenomena, rather than as crimes.
(9) Only those sexual acts to be considered criminal which infringe the sexual rights of another person.
(10) Systematic sexual education.

The League certainly has a strong body of supporters, for they quote Dr. Wansey Bayly, Arnold Bennett, Caradoc Evans, Prof. Patrick Geddes, Prof. Julian Huxley, Somerset Maugham, and other well-known names. The League also publish a journal. The subscription to the Congress is one guinea. Enquiries about the Congress may be addressed to Dr. Norman Haire, Hon. Secretary to the Congress, 127, Harley Street, London, W. 1; or to Capt. A. P. Pillay, O.B.E., M.B., B.S., Sholapur.

ALL-INDIA OPHTHALMOLOGICAL SOCIETY.

THE following is a report of the proceedings of the preliminary meeting held in Bombay on 15th and 16th March, 1929:—

"According to the notice issued under the names of Drs. R. P. Ratnakar (Bombay), F. Kugelberg (Tirupattur), B. G. S. Acharya (Lucknow), S. K. Mukerjee (Calcutta) and G. Zachariah (Madras), a preliminary meeting of ophthalmic specialists was held at the Seth Gordhandas Sundardas Medical College, Parel, Bombay, on 15th March. The meeting began at 6-30 p.m.

The following doctors were present:—

Dr. B. P. Banaji, F.R.C.S.I., Dr. R. P. Ratnakar, D.O., D.O.M.S., Dr. K. N. Karanjia, F.R.C.S.E., Dr. B. S. Sathaye, F.R.F.P.S., Dr. C. N. Shroff, D.O.M.S., Dr. J. Hansraj, D.O.M.S., Dr. Nanavati, D.O.M.S., Dr. Palkhiwalla, D.O.M.S., Dr. G. T. Modi, D.O., Dr. C. R. Athavale, D.O.M.S., Dr. Sardesai, L.R.C.P. & S., Dr. Abdulla bin Abdulla, M.D., Dr. J. M. Damany, D.O., D.O.M.S., Dr. Ghaswala, Dr. V. H. Bhandare, Dr. Chitnis, Dr. E. V. Srinivasan, M.B., Dr. G. Zachariah, D.O.M.S. and Dr. Subba Rao.

Letters regretting their inability to be present were received from Drs. B. G. S. Acharya (Lucknow), S. K. Mukerjee (Calcutta), F. Kugelberg (Tirupattur), B. K. Narayana Rao (Bangalore), R. K. Naidu (Poona), P. D. Desai (Bombay), R. D. Ranji (Bombay), J. N. Duggan (Bombay), N. A. Baxi (Bikaner), R. S. Shah (Rajkot), M. A. Dixit (Surat).

Dr. Banaji was proposed to the chair.

Dr. Zachariah detailed the events that led up to the calling of the preliminary meeting. A draft appeal had been drawn up and sent to Col. Coppinger, Col. Wright, Dr. Acharya, Dr. Narayana Rao, Dr. Duggan, Dr. Mukerjee, Dr. Ratnakar, and Dr. Kugelberg, with a covering letter asking for their support in issuing an appeal for the formation of an All-India Ophthalmological Society. Several of them heartily cooperated, and under their names an appeal was issued in July 1928 to all ophthalmic specialists. It was also published in some of the medical journals. Replies to this appeal were received from several men all over India, favouring the formation of such a society. It was therefore decided to hold a preliminary meeting in Bombay on the 15th of February, to consider the formation of the society. But the meeting had to be postponed at the last moment on account of the riots. The meeting was subsequently fixed for the 15th March.

After this preliminary statement was made, it was proposed by Dr. Sathaye and seconded by Dr. Shroff that an All-India Ophthalmological Society be formed. This was carried unanimously.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A tentative constitution which had been agreed upon by the signatories of the original appeal was then put forward. Discussion on this was carried on till 8-30 p.m., when the meeting was adjourned to 12 a.m. the next day.

At the adjourned meeting on the 16th, all those who attended on the previous day except Drs. Hansraj, Damany, Ghaswala, and Bhandare, were present. The constitution was further discussed and a final one framed.

The following Office-Bearers were next elected:—

President: Lieut.-Col. W. V. Coppinger, I.M.S.; Vice-Presidents: Dr. F. Kugelberg and Dr. B. P. Banerji, F.R.C.S.; Secretaries: Dr. G. Zachariah, D.O.M.S., and Dr. C. N. Shroff, D.O.M.S.; Treasurers: Dr. R. P. Ratnakar, D.O., D.O.M.S., and Dr. K. N. Karanjia, F.R.C.S.E.; Committee Members: Dr. J. N. Duggan D.O., Dr. Sardesai, L.R.C.P. & S. (Bombay), Major E. O. J. Kirwan, I.M.S., Lieut.-Col. H. Gidney, I.M.S., Dr. S. K. Mukerjee D.O., D.O.M.S. (Bengal), Dr. B. G. S. Acharya, D.O. (U. P.), Dr. B. K. Narayana Rao, D.O. (Mysore), Dr. E. V. Srinivasan, M.B. (Madras), Major Dick, I.M.S., and Dr. S. P. Shroff, F.R.C.S. (Punjab).

Finally it was decided to hold the first meeting of the society in Bombay during the third week of December beginning on the 17th or 18th."

Membership to the society is open to "all medical practitioners who practice ophthalmology as a speciality or are interested in ophthalmology and whose qualifications are satisfactory to the committee."

The subscription is Rs. 15 per year payable in advance.

Those who are desirous of becoming members are requested to send in their applications with their subscriptions to Dr. G. Zachariah, D.O.M.S., Flitcham, Marshall's Road, Egmore, Madras.

(*Note.*—Although the ideal is an excellent one, we cannot help feeling that the formation of an *All-India* Ophthalmological Society is too ambitious a scheme and unlikely to produce good practical results. The names of those present at the meeting called to form the society do not strike us as being representative of ophthalmology in All-India. The meetings will presumably be held in different cities each year and we cannot help fearing that the subsequent meetings may be no more representative of All-India than was the one reported above. The distances between the big cities in India are very great indeed and to induce the busy practitioner to travel 1,300 miles, say, from his home, he must be promised good value for his money.

The more practical plan would have been to form provincial societies which hold two or more meetings each year and then to form an ophthalmological section of the Indian Science Congress where from time to time there could be an interchange of ideas between provinces. However, the society has now been formed and we wish it every success.—EDITOR, *I.M.G.*)

Current Topics.

Some Aspects of the Surgery of the Spleen.*

By A. W. SHEEN, C.B.E., M.S. (Lond.), F.R.C.S. (Eng.).

(*The Lancet*, Vol. CCXVI, March 9th, 1929, p. 497.)

"With spleen's dead weight though heavy grown,
In life's rough tide I sunk not down,
But swam till Fortune threw a rope,
Buoyant on bladders filled with hope."

(*M. Green, born* 1696, *died* 1737.—"*The Spleen.*")

Historical Introduction.

A TRIBUTE to Hunter's work on the spleen is only appropriate. Hunter recognised that the organ was not essential to life, described it in over 40 vertebrates, and spoke of accessory spleens. He knew of injury and of enlargement in man. The "General Principles of the Blood" shows how Hunter sought for the solution of problems, many of which beset us to-day. There are nine original spleen specimens of Hunter's in the Hunterian Museum, including rupture, abscess, and cyst in man and normal spleens of various animals.

The case records of Hippocrates contain examples of enlargement of the spleen. In one work of the Hippocratic collection it is said "those persons whose spleen is large have their bodies meagre," which gave rise to Trajan's comparison that the Imperial Treasury was like the spleen, because when that was rich the people were impoverished. Suggestions in Pliny and the Talmud that the spleen was removed in men and in horses to increase their speed find confirmation in the recent work of Macht and Finesilver who, experimenting on rats trained to walk a tight rope, found that their speed was increased after splenectomy. It is now 300 years since Malpighi successfully tied the splenic vessels in a dog. The operation of splenectomy in man and animals has been performed by many workers in the past and is now being performed for various blood disorders.

Summary.

(1) Splenectomy is indicated in splenic anæmia (including Banti's disease) and in purpura. Each of these diseases is divided into a thrombocytopenic and a thrombocythæmic class. In our present state of knowledge operation should be reserved for the former class.

(2) Splenectomy is of value in selected cases of myelogenous leukæmia, but does not lead to a permanent recovery.

(3) After splenectomy for splenomegaly in a case of inherited syphilis the Wassermann reaction was negative three years later.

(4) Cases which at present can only be classified as splenomegaly do well after splenectomy.

(5) Attention is particularly directed to the necessity of a blood examination in cases of unexplained hæmorrhage from the stomach or uterus.

(6) All blood examinations when splenectomy is contemplated should include an enumeration of the blood-platelets.

(7) The morbid histology of the removed spleen is often difficult to interpret. Preoperative diagnosis may have to be revised in the light of the histological findings.

(8) Splenic anæmia (with Banti's disease) may only be a symptom-complex. A case, clinically Banti's disease, proved to be tubercle of the spleen and other viscera.

(9) Clinical appearances like Gaucher's disease may not be confirmed on examination of the removed spleen.

(10) An *x*-ray photograph will often show an enlarged spleen and such photograph may aid in diagnosis. This is illustrated by a case of hydatid of spleen.

* Abstract of the Hunterian Oration delivered at the Manson House, London, on 4th March, 1929. The oration was illustrated by a large number of specimens, photographs, microphotographs, drawings, microscopic and lantern slides.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(11) Radon applications will produce shrinkage of the spleen.

(12) Transfusion is of value as an adjunct to operation.

(13) Liver diathermy was used at one splenectomy with apparent benefit.

(14) A median incision is recommended for splenectomy with the operator standing on the right side of the patient.

Iodised Tincture of Guaiacol in the Treatment of Synovial and Serous Affections.

By JOHN MABERLY, M.R.C.S. (Eng.).

(*The Lancet*, Vol. CCXVI, March 2nd, 1929, p. 437.)

THE object especially in view was the treatment of pulmonary tuberculosis. The fact that guaiacol apparently had some beneficial action as an internal antiseptic in that disease suggested that its combination with iodine might give more definite results. Administration of the compound in several advanced cases of pulmonary tuberculosis over periods varying from one to eight weeks made it clear that, although the drug was non-toxic, it had no definite antiseptic action, at any rate in the finer lung tissue. Its use in place of potassium iodide in the class of cases in which I had been accustomed to use the latter drug, such as gummata and late neuro-syphilitic affections, proved that it was more efficient. In children with a tendency to enlargement of the tonsils and adenoids, which we now look upon as being probably dependent on a deficiency in thyroid extract, the tinctura iodo-guaiacol also appeared beneficial. Some interesting results in South Africa suggested that the drug had antiseptic action in the serous fluids and membranes, and experimental administration in pleurisy and synovitis confirmed this idea.

In my lung ward at the military hospital at Roberts Heights in 1917 and 1918 five cases of dry pleurisy came under treatment among malarial patients from East Africa. The symptoms in each case were typical, with dull patches, obscured breath sounds, friction, and pain on breathing. The temperatures were variable on account of the presence of malaria. All these cases cleared up rapidly on administration of one-drachm doses of tinctura iodo-guaiacol, given three times a day for the first 24 hours and then twice a day. Relief from pain was obtained within 24 hours and the physical signs disappeared in three or four days. During the last two years similar rapid relief from pain and symptoms has been obtained in patches of pleurisy among sanatorium patients suffering from pulmonary tuberculosis in England. In pulmonary tuberculosis especially one meets with cases in which there are old, permanently adherent patches of pleura which are subject to acute attacks occasionally. In these, although the pain and signs of active microbic infection quickly disappear, the dull patch of adhesion remains.

Whilst I was on military service more than one case of pleurodynia was sent into my wards diagnosed as pleurisy. This rheumatic form of nerve muscular affection does not come under the action of the tinctura iodo-guaiacol, but the preparation has proved curative in uncomplicated cases of acute pleurisy with effusion and also in the dry type. Cases which come under treatment after a definite amount of effusion has taken place naturally take longer to clear completely than do those in which the treatment is undertaken at an earlier stage. The resolvent action of the drug may, I think, be relied upon to create absorption in most cases without surgical interference. Where evacuation of the effusion seems necessary, aspiration or evacuation by simple incision, with immediate closing of the wound, is all that is necessary; the antiseptic and resolvent action of the drug should then be effective in completing the cure. If the pleura is left open and drained of its fluid, the drug fails to act so satisfactorily.

In many cases, especially in England, acute pleurisy is complicated with an unhealthy condition of the adjacent lung tissue, usually of a septic or pneumonic type. In these cases the results of administration of the tinctura iodo-guaiacol are not satisfactory or definite as in the uncomplicated cases. The drug has no disinfectant action in the finer lung tissue and, although the pleura will improve, the lung condition with cough and temperature may continue. In two cases of pneumothorax, one tuberculous and the other non-tuberculous, the results were very satisfactory. Healing and resolution took place in a very short time.

In the treatment of synovitis and teno-synovitis of septic and tuberculous types similar antiseptic and antiphlogistic action has been evident.

A number of cases of tuberculous and septic types of synovitis have at various times come under treatment, and in each case the same antiseptic and healing action has been obtained. The drug was tested in advanced tuberculous disease of the spine and hip-joint in which suppuration and disease of the cartilages or bones was present. In these cases it completely failed to have any definite effect. Its therapeutic action has proved to be confined to the synovial membranes only; when once the disease has extended to the other tissues, it has no longer any curative action. The same want of any definite disinfectant action is found if a synovial membrane, such as that of the knee, is opened and kept drained of its fluid, as in the case of the pleura. The antiseptic action, both in the pleura and synovial membranes, apparently depends on the presence of the serous or synovial fluids and the integrity of the membranes. It is not evident in the blood or other tissues of the body with the exception of the ciliary membranes. In traumatic inflammation of the joints, and in sprains about the joints and tendons, the tincture has a rapid antiphlogistic action. The pain and inflammation disappear after administration of the drug, though the effusion may persist for a variable time.

Conclusions.

The uniform results obtained in a fairly large number of cases of pleurisy and synovitis of various types justifies the conclusion that in tinctura iodo-guaiacol we have a drug which has a definite selective antiseptic and antiphlogistic action in these membranes, provided they are closed, and one which fills an important gap in our materia medica for the treatment of septic, tuberculous, and traumatic inflammation of those membranes. It also exhibits the well-recognised resolvent effect of iodine.

The therapeutic effects of the tincture in the pleura and synovial membranes suggests that a similar action would be present in the other serous membranes and spaces, such as the cerebro-spinal and peritoneal. A limited experience of the use of the drug in meningitis, and in syphilitic and other infections of the cerebro-spinal system, supports this contention and further work on these lines appears very desirable. In the cases in which I have used the drug with apparent success lumbar puncture was not performed. In three cases of severe meningitis treated by another observer, lumbar puncture and the instillation of medicated serum was performed before and during the administration of the tincture. The results were completely negative. In any future work on these lines I would suggest that lumbar puncture should be avoided. It seems most likely in the case of a drug which only acts in a certain environment that any interference with that environment would nullify its action.

Dosage.

One fluid drachm given twice a day is sufficient in ordinary adult cases. In acute or dangerous conditions two or more drachms have been given every four hours for two or three doses. After that the smaller dose given once or twice a day has been found sufficient. Children are tolerant of the drug and take half to one drachm given in a similar manner. The addition of a little simple syrup to each drachm of the tincture, and water to half a fluid ounce is not an unpleasant mode of administration. Chloroform either alone or in solution is quite incompatible.

It is very difficult in general practice, without the facilities of a hospital and skilled laboratory help, to carry out to a satisfactory conclusion any therapeutic

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

investigation, especially if the results are unexpected. One has to wait a long time for suitable cases, and when they do occur they are not under the skilled supervision which is desirable for scientific records.

Note.—The British Drug Houses, Ltd., have undertaken to place the preparation at the disposal of the medical profession.

Combined Drug Therapy in Some Problems of Cardio-vascular and Renal Disease.*

By J. G. MURRAY, M.D.

(*Southern Medicine and Surgery*, Vol. XCI, February 1929, p. 69.)

IT is the purpose of this paper to crystallize our thoughts regarding the relative value of certain drugs in the treatment of two important problems of cardio-vascular-renal disease, namely, œdema and high blood pressure. We meet with these complications frequently, especially in one particular type of cardio-renal disease. I have in mind the œdematous, dyspnœic hypertensive type with a decompensating heart and a small grey, granular kidney of the so-called chronic interstitial nephritis and arteriosclerosis. In other words, the typical old cardio-renal patient of the charity ward.

Conclusions

First, we observed that digitalis in large doses in combination with citrin (cucurbo-citrin) was more effective than either drug alone, digitalis improving the force of the heart action, and citrin lowering the vascular tension.

Second, it was evident that novasurol and ammonium chloride produced more effective diuresis in combination than did either drug separately.

Finally, the combination of drugs giving the most convincing and most consistent results in these decompensated cardio-renal-vascular cases were found to be: digitalis acting on the heart, citrin relieving vascular tension, and novasurol and ammonium chloride, one or preferably both, increasing the urinary output. Thus by the use of these four drugs in combination, we get direct action together on heart, artery and kidney.

Practical Notes.

(Abstracted from *The Practitioner*, Vol. CXXI, December 1928.)

The Treatment of Migraine.

M. SEROG presents an analysis of twenty cases of severe migraine in which he has obtained remarkable improvement by the use of intravenous injections of strontium. Three injections of a strontium salt are given, 5 c.cm. on two consecutive days and the third two days after. From the results obtained and the known action of strontium in causing an increase in the tone of blood vessels, Dr. Serog concludes that the basis of the condition migraine lies, not in vascular spasm, but in hypotonic disturbances of the vaso-motor system.—(*Medizinische Klinik*, August 17th, 1928, p. 1279.)

The Treatment of Sterility in Women.

E. Douay has found the following treatment successful in cases of sterility due to atresia of the cervix uteri, whether congenital or caused by displacement of the uterus or by spasm. Under general anæsthesia the cervix is dilated, and a bilateral incision is made into it. Without curettage, an elastic tube is then passed into the uterus; this tube is of the same type as an in-dwelling catheter, with dilated ends. Vaginal douching is carried out for 48 hours and the tube may be left in place for as long as two months.—(*La Gynécologie*, August, 1928, p. 483.)

The Treatment of Ozæna.

E. Feldstein observes that the ætiology of ozæna still remains a mystery, in spite of much research and many enticing theories. It has been well recognized that the paradiphtheritic bacillus is encountered with remarkable frequency in the nasal secretions in ozæna, and Dr. Feldstein's bacteriological examinations have confirmed this. The logical consequence of the discovery of the paradiphtheritic bacillus was the employment of Roux's serum in the treatment of ozæna; but the results, though successful, were fleeting. Dr. Feldstein, however, has been employing, with great success, the diphtheria anatoxin of Ramon; intramuscular injections are given twice weekly for two months, beginning with half a c.cm. and increasing to 3 c.cm., diluted with an equal quantity of physiological serum. A second series of injections is often necessary two or three months later. The crusting, the unpleasant odour, and the atrophic pharyngitis soon disappear under the influence of this treatment.—(*Journal des Practiciens*, October 20th, 1928, p. 681.)

The Treatment of Vomiting in Children.

F. Hamburger, in dealing with the numerous conditions which give rise to severe vomiting in children, describes the treatment he has successfully employed in the chronic vomiting associated with catarrhal conditions of the stomach in the neurotic type of school child. He gives the following mixture in five-drop doses three times a day before meals:

℞

Tinct. gent.	.. ..	g. 2.0 (m.xxx.)
Tinct. nuc. vom.	.. ..	g. 3.0 (m.xiv.)
Tinct. chin.	.. ..	g. 15.0 (ʒiv.)

With this he gives atropine sulphate in doses of g. 0.001 (grs. 1|150) as this tends to lessen the irritability of the gastric mucous membrane. An easily assimilated diet must be given at the same time. It is sometimes advisable to give the atropine by subcutaneous injection if it is not well tolerated by the mouth. For the distressing vomiting which accompanies whooping-cough, Dr. Hamburger has found papaverine, g. 0.3 to 1.0 : 150, one teaspoonful three times a day, of great help.—(*Münchener Medizinische Wochenschrift*, September 14th, 1928, p. 1605.)

Fractures of the Ankles.†

By FRANK D. DICKSON, M.D.

(*The Journ. Amer. Med. Assoc.*, September 22nd, 1928, Vol. 91, p. 845.)

Treatment.

IT is the routine in our clinic that all ankle fractures be reduced at the earliest possible moment and fixed in a plaster cast.

Reduction is made under full anæsthesia. The ankle is grasped with one hand, pressure being made outward in the region of the internal malleolus. The foot is grasped with the other hand well back toward the heel, the thumb resting just below the external malleolus and the fingers grasping the inner side of the heel. With the hands in this position, the foot is inverted and pushed sharply inward. Particular care must be taken to see that the heel is inverted and not just the movable anterior part of the foot, as it is through the posterior part of the foot that the fragments are controlled. Only a moderate degree of inversion is necessary but no harm comes from too much inversion. When backward or forward displacement of the foot is present, this must be corrected by appropriate manipulation. In the occasional case in which there is an inversion displacement instead of an outward displacement, reduction is the opposite from that described here and the foot is put up in its normal position, care being taken to avoid

* Presented to the Greenville County Medical Society, 5th November, 1928.

† Read before the Section on Surgery, General and Abdominal, at the Seventy-ninth Annual Session of the American Medical Association, Minneapolis, June 15th, 1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

over-correction because of the danger of later flatfoot. The essential feature of the reduction is a restoration of the ankle mortise. Failure to achieve this results in a faulty weight-bearing surface at the ankle joint, and a painful and impaired extremity which can be improved only by later operative intervention. The position of the bones should be checked at intervals by the help of *x*-rays.

With the foot inverted and as close to a right angle as possible, the cast is applied, over a raw cotton bandage which is about one-fourth inch thick, and is immediately bivalved. This enables one to take care of subsequent swelling, allows of easy access to the entire limb for inspection, and at the same time holds the fractured bones firmly in place. Many experienced surgeons prefer to fix the leg in a pillow splint or fracture box for the first three days to a week before applying plaster. It is my feeling, however, that the fracture can best be controlled by the immediate application of plaster, and that swelling is less and disappears more rapidly with such firm fixation. All agree that immediate reduction is best.

I shall mention Debet's gypsum apparatus only to say that it has become quite a popular form of dressing in ankle fractures, but one that seems more fitted for use in fracture clinics than in general practice.

The after-treatment consists in removing the anterior half of the cast at the end of the second week and starting light massage and toe movements, the posterior shell remaining in place. In four weeks, the foot is removed from the plaster shell and gentle motion is allowed. At the end of from six to eight weeks, depending on the severity of the fracture, the cast is discarded and a shoe used into which a hard felt arch is fitted. This supports the arch and maintains inversion of the foot. At times, it is desirable to elevate the inner edge of the shoe three-sixteenths of an inch for a month, or until full strength has returned to the supporting muscles.

Pyorrhœa Alveolaris.*

By HUMPHREY HUMPHREYS, O.B.E., M.C., M.B., CH.B., M.D.S., L.D.S.

(*The Brit. Med. Journ.*, January 19th, 1929, p. 99.)

TREATMENT.

IT is an axiom that all sound treatment of disease should be directed towards its cause, and not to its symptoms. Over the predisposing causes of pyorrhœa we have as yet no control, and if our conception of its exciting causes is well founded it follows that our sole aim in treatment should be the continued prevention of oral stagnation; and in fact the conception of oral stagnation as its cause rests not only on the evidence of pathology, but on the clinical fact that the therapeutic measures directed against it are the only ones that do produce a permanent result. What measures, therefore, are open to us? We cannot expect to see the adoption of a diet so coarse and astringent that it would be sufficient in itself, and the treatment possible divides itself into surgical and medical procedures.

Surgical Treatment.

The paramount surgical treatment is a complete removal of all the calculus, and this scaling, in the great majority of cases, will have to be repeated at regular intervals. It is obvious that, however thoroughly the calculus is removed, the cause that led to its deposit in the first instance will bring about the same condition again; and the medical measures I shall describe, directed to the removal of that cause, are seldom so thoroughly carried out or so perfectly effective that the need for subsequent scalings will not arise. Another surgical measure of great value is the abolition of any pockets that may exist—that is, the removal of the gum to the level of the floor of the pockets, by the knife, the cautery, or by escharotic drugs. The existence of pockets renders the task of preventing stagnation around the teeth, which is the goal of all our treatment, peculiarly difficult, and the clinical results of gum resection are uniformly excellent.

Medical Treatment.

The surgical measures I have mentioned, though they arrest the course of the disease for the time being, cannot be expected to effect a permanent cure. The patient will be no less liable to oral stagnation, a fresh deposit of calculus, and a recrudescence of the disease than he was before, and the surgical measures must be followed up by some daily measure of oral hygiene which will, as far as is humanly possible, prevent a recrudescence of pyorrhœa by preventing oral stagnation. No measure that is not repeated daily can hope to maintain a permanent cure, and it follows that effective medical treatment can only be undertaken by the patient, and will be effective in proportion to the diligence we can persuade him to practise.

There are three methods I have tried in my own practice: (1) daily irrigation of the gums and interdental spaces with a powerful spray from an atomizer; (2) daily cleansing of interdental spaces, and any pockets in the gum that are not resected, with hydrogen peroxide applied through a fine root syringe; and (3) saline massage. The salt promotes a flow of serum into the pockets and interdental spaces by osmosis; the massage first squeezes this out and then causes the pockets to fill up again with serum. Stagnant areas are thus sluiced out by the patient's own serum.

Daily medical treatment by the patient himself somewhat on these lines is, I believe, the only treatment likely to give results that are permanently satisfactory. The other forms of medical treatment are mostly aimed at what we now know to be complications of the disease, such as infection of the pockets with pyogenic organisms, rather than at the primary condition; and conditions such as pus formation usually disappear spontaneously in response to the measures I have mentioned. If they do not, then a course of special treatment may sometimes do good—either the old method of treating the pockets with caustic drugs, or a course of vaccine therapy, or ionic medication, or treatment with high frequency current. Nothing is more easy than to effect a cure of pyorrhœa if by cure is meant an arrest of pus formation. Only too often the so-called cures have meant little more than success in eliminating this particular complication of the disease for the time being.

While it remains true that active pyorrhœa does not adversely affect the general health as much as was formerly believed, and far less frequently than apical infections, it is not to be thought that it is wholly innocuous. Its ill effects are most often seen in diseases of the digestive tract, as its toxic products drain into the mouth rather than into the blood; very few cases have occurred in my clinical practice where diseases of the rheumatic group were produced.

The relatively innocuous nature of pyorrhœa compared with apical infections is usually explained as the difference between an open and a closed infection, the toxic products of pyorrhœa draining freely into the mouth and the bacteria being killed by the gastric juices, while the toxic products of apical infections must of necessity find their way into the system. But there is another and more significant difference between the two conditions. An infection of the gums is freely exposed to all the defensive mechanisms of the body, phagocytes, antibodies, and antitoxins, which in most cases constitute an adequate defence. But an infected pulp chamber constitutes a stronghold for bacterial growth, completely protected from all the natural defence forces of the body where germs can multiply and discharge their toxins and themselves into the system with impunity.

* A post-graduate lecture delivered in Birmingham on November 8th, 1928.

Remarks on the Treatment of Empyema.†

By F. G. THOMSON, M.A., M.D., F.R.C.P.

(*The Brit. Med. Journ.*, January 19th, 1929, p. 89.)

THE principles to which any ideal form of treatment for empyema should conform are:—

(1) Operative procedure should be such as involves the minimum of time and the minimum of shock.

† An address given to the Trowbridge Division of the British Medical Association, November 1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(2) If it is necessary to employ the method of open drainage, this should never be performed until it is reasonably certain that the empyema cavity has become sealed off from the rest of the thorax by adhesions.

(3) In connection with the last it is imperative to distinguish between pneumococcal empyema, in which adhesions are usually formed by the time the empyema is diagnosed, and streptococcal empyema, where adhesions are not usually formed till later.

(4) In order to minimize the risk of secondary infection the opening in the chest wall should be no larger than is sufficient to admit a suitable drainage tube, and should fit closely around the tube when it is placed in position.

(5) The cavity should be sterilized as early as possible by frequent irrigation with some suitable antiseptic, to prevent the formation of dense fibrous adhesions, which prevent the expansion of the lung and the early closure of the cavity.

(6) The lung should be encouraged to expand by ensuring a negative pressure in the pleural cavity throughout the period of drainage.

(7) Convalescence should be assisted by giving plenty of nourishing food, and whenever possible, by treating the patient entirely in the open air.

The method of treatment which would appear to fulfil these principles more completely than any other is that of closed continuous-suction drainage. The technique usually employed, of introducing a stretched rubber tube through a metal cannula, which is allowed to remain in position, presents a very real disadvantage in the fact that the cannula is very apt to become displaced, especially in a restless child, and come out of the chest, pulling the drainage tube with it. This difficulty is entirely obviated by using a self-retaining rubber catheter, which is either introduced direct through a very small incision into the chest, or through a cannula, which is withdrawn immediately the drainage tube has been inserted. I have had an oval trocar and cannula specially made to enable a larger catheter to be introduced between the ribs than would otherwise be possible, but I am not sure that this method presents any material advantage over the method of direct introduction through a small incision in the chest wall. Two other disadvantages have been cited against this form of treatment—namely, that it is difficult to ensure adequate drainage, and that after-treatment requires almost continuous supervision by specially trained nurses. With regard to efficiency of drainage, we have not found the difficulties so great as would be thought. Irrigation of the cavity by Dakin's solution, two or three times a day, seems to soften or disintegrate those large masses of fibrin which so often impede the free passage through the tube. If the latter appears to be blocked it is detached from the suction apparatus, and, by means of a glass syringe, Dakin's solution is alternately forced gently through the tube and sucked out again. By doing this a large amount of fibrin can often be removed, and when the suction apparatus is replaced drainage is found to proceed quite satisfactorily. The last objection to continuous suction, that it requires unremitting attention, is only partially true. Once it is satisfactorily started very little attention is required, unless the tube gets blocked and requires syringing out, as it occasionally does. Irrigation with Dakin's or some other antiseptic ought to be carried out at least two or three times a day, no matter what method of drainage is adopted, and it is much easier to detach the suction pump and irrigate through the catheter than it is to remove the messy dressings from a patient's chest and irrigate through an ordinary open tube. One way and another, I do not think that this method requires more attention than can easily be given in the ordinary routine way in a hospital ward or a nursing home.

After removal of the catheter I have, in all cases, put a fine tube into the sinus to drain the small cavity remaining. The sinus is usually healed completely after three or four days, but in four of my patients the wound, after closing up, has broken down again, and a small abscess has discharged, after which the sinus has again closed up and given no further trouble. This is perhaps due to the wall of the sinus itself being infected, and can probably be obviated by treating the latter with flavine or some similar preparation. In all cases except one the cure has, I believe, been complete, and, so far as one can tell, permanent. One patient, who originally had a very large staphylococcal empyema of ten weeks' duration, returned to his work as a miner some six weeks after discharge, and came back to hospital two months later with an abscess pointing over the old sinus; some six ounces of pus were evacuated from the cavity, which rapidly healed and has not, so far, recurred. Another patient had a double empyema, both sides being drained simultaneously, and closing on the seventeenth and eighteenth days respectively. This patient has remained fit ever since, and I am informed he has been for some months working about his farm as usual.

The average period during which drainage has been required has been nineteen days. One particularly satisfactory feature in all has been the rapid expansion of the lung, as shown by the amplitude of respiratory movements on the affected side, and the return of breath sounds at the base.

The advantages that I think one can justly claim for treatment by continuous suction drainage are:—

(1) Introduction of the catheter is rapid and easy, and entails virtually no shock.

(2) Anæsthesia is correspondingly brief, and, if necessary, the operation could be done, except perhaps in infants, with a local injection of novocain.

(3) The tube causes little or no pain.

(4) Nursing of the patient is much easier and cleaner.

(5) The risk of secondary infection of the empyema is very much diminished.

(6) The wound closes quicker than by open drainage.

(7) Re-expansion of the lung is more rapid and complete.

Sleep in the Treatment of Acute Disease.

By J. WALTER CARR.

The Lancet, p. 1181.

(Abstracted from *The Medical Review*, Vol. XXXII, January 1929, p. 15.)

A WOMAN of 65 was seen in consultation. She had been ill for 12 days with increasing bronchitis, which had got much worse during the last 24 hours. Her temperature was 100°, pulse 115, respirations 36, with orthopnœa, working of the alæ nasi, and much inspiratory recession. Expectoration had gradually been diminishing and had almost ceased, but abundant large and small, moist, non-consonating adventitious sounds were heard all over the lungs, especially at the left base. It seemed very doubtful whether she would live another 24 hours. She was treated with stimulant expectorants, vigorous counter-irritation to the chest, both front and back, and inhalations of oxygen at frequent intervals. Two days later she had just held her own, but her colour was bad, sputum still very scanty, and she was obviously becoming exhausted; she felt worn out, for she had had only short snatches of unrefreshing sleep. The situation appeared wellnigh hopeless. It seemed that after another restless night of constant, ineffective cough, heart failure would follow; on the other hand, it seemed equally certain that any drug sufficiently powerful to compel sleep would cause the secretion in the bronchial tubes to accumulate and lead to asphyxia.

With much hesitation the writer gave by mouth a tablet of 1/6th grain of morphia and 1/100th of atropine. She slept fairly soundly for several hours, but the colour became worse and respirations increasingly shallow. She was kept alive by oxygen given through a tube passed into the nostril, which fortunately did not interfere with her sleep. When she awoke she felt better, and began to cough more effectively. Her condition remained critical for some days, and the morphia and atropine had to be repeated one night, but improvement, though slow at first, was fairly continuous; she

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

began to expectorate increasing quantities of thick, purulent sputum and eventually recovered.

Had the rule not to give morphia to an elderly patient with advanced general bronchitis not been broken, the writer believes she would have succumbed. The rule is excellent, but, like all others in medicine, must not be adhered to blindly, although in such desperate cases the doctor is likely to feel that, as the patient will probably die anyhow, it is better that the end should be brought about by the disease rather than by the remedies. The risk was great, but less, it seems, than that of another sleepless, exhausting night. The morphia was given by mouth because it seemed likely that its action, whilst equally effective, would be more gradual and therefore safer than hypodermically. The atropine is presumably useful by diminishing the secretion in the bronchial tubes and so the danger of asphyxia.

In many forms of heart disease morphia as a narcotic is still more generally helpful, without the danger necessarily attendant upon its exceptional use in severe bronchitis. Its value in advanced aortic disease, in which as soon as the patient drops off to sleep he is disturbed by dyspnœa, is generally recognized. More hesitation is felt in giving it in mitral disease, with a failing, irregular heart, and general œdema. The lungs are more or less water-logged, there is probably some albuminuria, and it is feared that morphia may lead to dangerous accumulation of secretion in the bronchial tubes. This need not be anticipated; sound sleep is as valuable a tonic to a fibrillating heart as digitalis; at times probably even more valuable, for digitalis or any other cardiac tonic is likely to be more effective if the patient can enjoy at the same time the benefit of restful sleep.

The early stage of acute pneumonia affords another example of the value of morphia or opium. In the later stages, especially in the elderly, their use is attended by considerable danger of respiratory failure; but during the first 2 or 3 days, by securing sleep, they conserve vitality for the trying time to come and probably diminish the chances of delirium, one of the gravest risks to life in pneumonia. They are, of course, particularly useful when pain is causing sleeplessness.

In the above instances morphia or opium was used rather than one of the milder synthetic hypnotics. Some of these are very valuable, but in acute illness, in which fairly deep sleep lasting several hours is urgently required, none is so reliable or so lasting in effect as morphia or opium.

Therapeutic Notes.

(Abstracted from *The Prescriber*, Vol. XXIII, February, 1929, p. 70.)

EPHEDRINE and the Heart.—W. A. Bloedorn and P. F. Dickens, of Washington, D.C. (*Arch. Int. Med.*, 1928, Sept., 322), warn against the use of ephedrine in patients showing evidence of cardiac injury. In a case diagnosed as asthma, in which ephedrine had been used, they observed signs of serious cardiac embarrassment, including pulsus alternans, marked tachycardia, and cardiac decompensation. Extreme care is necessary in the diagnosis of bronchial asthma, as cases of so-called cardiac asthma are frequently put in this group. If during the administration of ephedrine the patient exhibits toxic symptoms such as palpitation, tachycardia, arrhythmia, or vaso-motor disturbances, the drug should be promptly discontinued.

New Remedial Agents.
Salyrgan: A Mercuric Diuretic.

(Abstracted from *The Prescriber*, Vol. XXIII, February 1929, p. 71.)

THE employment of organic compounds of mercury as diuretics is comparatively recent. Calomel and other mercurials have for many years been recommended for this purpose, but they have never come into general use. The organic mercurials were originally designed not as diuretics but as antisyphilitics, and their diuretic properties have come to light only in the last few years.

The first compound to find this new application was *Novasurol*. This is a double salt of sodium mercuri-chlorphenyl-oxyacetate with diethylbarbituric acid (barbitone). A year ago a new mercurial diuretic was introduced under the name of *Neptal* or "440B," which has the same chemical composition as *Salyrgan*. The composition of neptal (as of salyrgan) was given as sodium mercury-salicyl-allyl-amido-acetate, and its diuretic properties had been favourably reported upon by French workers.

Recently American observers have been reporting on the diuretic properties of salyrgan, and a searching chemical examination has been made of it in the laboratories of the American Medical Association. The result of this examination shows that while the presence of certain groups and radicals claimed by the German manufacturers was confirmed, the formula as originally published is not strictly correct. Salyrgan appears to be a definite chemical compound—sodium hydroxymercuric-methoxypropyl-carbamylphenoxy-acetate, or $NaOOC.CH_2.O.C_6H_4.CONH.C_3H_5.(O.CH_3)(HgOH)$. Salyrgan, called in America Mersalyl, is a complex synthetic mercurial prepared by the action of mercury acetate and methyl alcohol on salicyl-allyl-amido-acetic acid and subsequent conversion to the sodium salt. It contains 39.6 per cent. of mercury in non-ionizable form.

Salyrgan has been found to exert a destructive action on the spirochæte of syphilis in rabbits, but is used chiefly as a diuretic. It induces diuresis only provided sufficient renal tissue is still intact, and is therefore contra-indicated in acute diseases of the kidney as well as in advanced nephritis. It is effective in ascites and œdema of cardiac and cardio-renal origin; also in ascites resulting from cirrhosis of the liver. It has been tried in hydrothorax, pericardial effusion, and in the ascites of tuberculous peritonitis, but without uniform results.

Salyrgan is supplied in the form of a 10 per cent. solution. As diuretic, an initial dose, intramuscularly or intravenously, of 0.5 c.c. of the solution is given to test tolerance; this is increased to 1 c.c. or to a maximum of 2 c.c. if required; injections are made at intervals of from three to five days.

Reports on the use of salyrgan, both as an anti-syphilitic and as a diuretic, have appeared during the past few years in continental literature. Quite recently a careful study of its value in œdema has been made by Barker and O'Hare, of Boston, Mass. For the past five years these workers have been particularly interested in the œdemas of non-cardiac origin, and have experimented with numerous drugs in their attempts to get rid of the stored fluid in such cases. For some time they used novasurol with benefit, but noticed that a proportion of their patients showed some form of mercurial irritation, and they used the drug with some hesitation. During the past year they have employed salyrgan as a diuretic in thirty patients exhibiting various forms of œdema, ascites, and pleural effusion. The dosage followed was that given above, the intravenous route being found to give a better and more prompt response. In all cases (except four, in which the failure is more or less explicable) the diuresis began in from one to four hours and was complete in from eight to twelve hours. The drug is therefore best given in the morning. In patients who responded poorly to salyrgan, ammonium chloride or nitrate was given in conjunction with the mercurial, as is recommended in the case of novasurol. This had the effect of making the salyrgan much more effective. The ammonium salt is given in doses of 8—15 gm. daily, being started usually from three to four days before administration of salyrgan. In no case has any evidence of toxicity or irritation been observed. The action of salyrgan seemed to wear off after a time in some cases. The cases of cardiac œdema, ascites due to cirrhosis of the liver, and the anasarca of nephrosis showed the greatest diuretic effect.

Barker and O'Hare conclude that salyrgan is a good diuretic with a wide range of application, and is relatively non-irritating. It is particularly valuable in circulatory failure and the ascites due to cirrhosis of the liver and chronic nephrosis. Like novasurol it is more effective in the presence of acid-forming salts, and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the ammonium ion seems to be most effective when supplied as ammonium chloride or nitrate.

The Acnes.

By W. N. GOLDSMITH, M.A., M.D., M.R.C.P.

(*The Medical Press*, February 6th, 1929, p. 112.)

Introduction.

THE clinical appearance of acne is very well known. The comedo results from a hyperkeratosis of the funnel-shaped opening of the follicle. Its free extremity is coloured not by a deposit of dirt, but by oxidation of the keratin itself. When they exist alone they constitute "acne punctata." The topography is very special. It scarcely ever passes beyond the waist, nor the upper two-thirds of the arms, nor the boundary of the scalp, which always escapes. The eruption is continuous, but shows exacerbations in the spring, during menstruation, and after departures from normal régime.

Ætiology and Nature.—An essential condition for acne is what Darier calls *la Kerose:* the patients always have seborrhœa, pityriasis simplex, or dandruff, and sometimes seborrhœic eczematides. The predisposed terrain pre-exists and survives the acnes. It is said persistently to be favoured by sexual excitation and functional or organic genital troubles, especially when in women it is localised to the chin, but I have not observed such a close association. The onset at puberty, and its disappearance by the age of thirty, does suggest strongly some endocrine influences, but the genital organs themselves may play no more direct part than they do in the disappearance of tinea tonsurans at puberty. The determining cause is almost certainly a local infection.

Bacteriology.—The comedos contain myriads of small bacilli, some pityrospora of Malassez, and some cocci. The pustules are either sterile, or they contain a few white staphylococci or some acne bacilli.

In 1925, I carried out some work on the staphylococci of acne vulgaris, comparing the staphylococcal flora of the pustules, comedos, and surface of the skin of acne patients, and of normal controls. Thirty-three individuals were examined, and about ninety separate strains investigated. Methods used included growth on agar, in broth, in gelatine, on Löffler serum; the reduction of nitrates, formation of hæmolysin, agglutination, formation of lipase, and pathogenicity for mice. Several strains of staphylococcus pyogenes aureus from furuncles were used as standards for comparison.

My conclusions were:—(1) I found no difference between the staphylococcal flora of acne pustules, surface of the skin of acne patients and normal skin. (2) This flora is composed preponderatingly of white, and only to a very small extent of coloured, strains (mostly golden-yellow or brown, occasionally lemon-yellow). (3) None of these coloured strains proved to be staphylococcus pyogenes aureus or citreus. (Thus I came across not a single staphylococcus pyogenes aureus or citreus on the skin of the cheeks of fourteen normal persons, and nineteen acne patients, nor in the acne lesions.) (4) Whether among the many varieties of white staphylococcus any should be identified with staphylococcus pyogenes albus, I could not decide for certain. According to the usual definition, that it resembles the staphylococcus aureus in all except pigment, then none were identical. But two strains of so-called staphylococcus pyogenes albus obtained from Kral's laboratory for comparison did resemble a few of my strains. I am not yet quite convinced that such an organism as staphylococcus pyogenes albus really exists. (5) A series of intradermal reactions performed with a vaccine of cocci from acne pustules, showed that there was no difference in the reaction of acne skin and normal skin.

These investigations failed to establish any evidence supporting the idea that staphylococci play any part in the causation of acne vulgaris. It still remains to test the claims of the acne bacilli.

General Treatment.—I do not know of any internal treatment that can be relied upon. Staphylococcal vaccines are irrational. Acne bacillus vaccines do sometimes seem to help, but generally do not. In one case a generalised eruption followed its administration. Possibly this was an "acneide" comparable to a trichophytide, but I do not know of any other such cases. General ultra-violet light baths, in one case, completely cleared up in a short time a case which did not respond to local ultra-violet rays, but I have not tried this in many cases.

Local Treatment.—This, on the contrary, will clear up any case if perseveringly persisted in, but there will always be a tendency to relapse, till the age of about twenty-five has past. The best results are obtained by producing a mild, dry exfoliation. This is best effected by a paste of equal parts of powder and grease, containing sulphur and resorcin, of each 6 per cent. to 25 per cent. The strength of these active ingredients must be increased at the expense of zinc oxide or talc until the desired peeling is obtained. It is simply spread on at night after thoroughly washing with soap and water, and cleaned off in the morning. Ultra-violet light will also produce considerable improvement at first, but it is difficult to maintain its effect, and it is time-consuming. In nodular cases a course of *x*-rays is needed, and is always effective in softening the nodules. It is only in this type that I consider their use advisable. If definite fluid abscesses form it is best to aspirate them. This is the only instrumentation that is desirable in any stage.

Drug and Occupational Acnes.

These are closely related to acne vulgaris, and clearly show how important a part is played by predisposition, whether the eruption is determined by external or internal agents.

Iodides and, to a lesser degree, bromides, produce, in certain subjects particularly, either at once or after prolonged administration, an acne-like eruption. It seems to attack particularly those in the age period susceptible to acne vulgaris. It is generally rather acute in onset, inflamed and infiltrated. The distribution is also similar to that of acne vulgaris, but the comedos are not seen. I remember one case of acne vulgaris in which, after its development, bromide had to be administered for epilepsy. Whenever bromide was taken the eruption became greatly aggravated, but it was not possible to distinguish the bromide from the ordinary acne vulgaris lesions. I do not know if a critical study has been made of the bacterial contents of bromide or iodide acne, but this would be an interesting study.

The various tars, especially oil of cade, can produce in those who handle them or use them for treatment an eruption of reddish-brown papulo-pustules with central comedos very much like acne, but this occurs more especially on the limbs, and these lesions generally contain the staphylococcus pyogenes aureus. It looks, therefore, as if this acne merely consisted of a staphylococcal folliculitis predisposed to by a special external irritant. Much the same may be said of the paraffin acne, but here there is the added feature of a plugging of the pilosebaceous follicles by hyperkeratosis at their orifices.

Chlorine acne, and which is especially observed in those who work in the electrolysis of sodium chloride, shows the characters of acne vulgaris, but immeasurably exaggerated, and with an extraordinary profusion of large comedos, and an extension to regions which acne vulgaris respects. In spite of many researches on the subject we are still ignorant whether it is the free chlorine or some combination that is responsible, or whether the chlorine acts externally or by inhalation. Possibly the halogens render the follicles susceptible to a staphylococcal infection as tar does, in which case it would be definitely distinguished from acne vulgaris; but as I have pointed out above, a true acne vulgaris can, apparently, be greatly aggravated by bromide.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Ophthalmological Notes.

(Abstracted from *Amer. Journ. Ophthal.*, Vol. XII, February 1929, p. 150.)

Antonibon, A. Modification of the action of some ophthalmic drugs by potassium. *Ann. di Ottal.*, 1928, V, 56, May, pp. 403—419.

SEVERAL authors have claimed that the addition of potassium salts to local anæsthetics increases their effect. The author tried to confirm this with respect to the action of cocain, novocain, stovain, tropococain, eucain, halocain, and tubocain and also of the common cycloplegics and miotics on the normal human cornea, adding KCl to these drugs to make a concentration of one per cent. With two per cent. cocain, the average time required to abolish the corneal reflex was 31.2 seconds, while with cocain and KCl this was reduced by about a half (16.3 seconds). A definite reinforcing effect, though somewhat less marked, was noted with one per cent. cocain and two and four per cent. novocain. With the other anæsthetics, the effect of KCl was less marked.

In the case of the mydriatics, the size of the pupil was noted at intervals until maximal dilatation. With atropin and KCl mydriasis developed at about the same rate, but dilatation from one to two mm. greater was produced than with atropin alone. A definite reinforcement of the mydriatic effect of scopolamin and eumydrin but not of homatropin was noted.

With eserin, no increase in the miotic effect was noted, but with pilocarpin this increase was definite, averaging 0.6 mm. A definite increase in the effect on tension was also noted with eserin in normal eyes, while in a case of glaucoma this difference was marked.

The reinforcing effect of KCl on the action of some drugs must be considered as an example of true synergism, since KCl alone causes no effect similar to that of these drugs. The author suggests that this synergistic effect may prove of practical value in the use of eserin for glaucoma.

Frydman, R. Protein Therapy in Ophthalmology. *Rev. Gen. d'Opht.*, 1928, V, 42, March, p. 85.

AT the ophthalmic clinic of the university of Geneva the author treated fourteen cases with cibalbumin, which contains one per cent. egg albumen. Ocular affections of gonococcic origin undoubtedly were improved by the protein treatment. In iritis the results were often transitory, and relapses were frequent both during and after treatment. One case of serpiginous ulcer of the cornea was cured by the treatment; another was not affected. The results were excellent in a case of panophthalmitis due to a perforating foreign body.

The author concludes that protein treatment by intramuscular injection presents no danger for either the general organism or the eye and is easily applicable to ambulatory cases; that it gives remarkable results in a large number of ocular affections, especially of the deep membranes; but that it is not a panacea.

Vasek, E. Miscellanea collected from modern ophthalmologic therapy. *Ofthalmologicky Sbornik*, 1928, V, 2, p. 207.

KNAPP'S tattooing with two per cent. acid gold chloride solution without adrenalin or tannic acid was tried in ten cases. In old dense leucomas it was a failure; the thin leucomas were coloured dark purple, but after one year a diminution in the depth of colour was apparent.

Lagrange's colmatage for raising intraocular tension was performed in two cases of myopic retinal detachment and one case of traumatic detachment in a hyperopic eye. Only the last case remained for observation; the tension rose, the retina reattached itself, the field of vision widened, and vision rose from perception of hand movements to 5|15.

Glaucosan was used in one case of advanced simple glaucoma, in two cases of glaucoma secondary to occlusion of the pupil, and in one case of iridocyclitis with high tension. In the last case the result was good; in the two secondary glaucomas intraocular tension rose further. Iridectomy was performed on the primary glaucoma after a few glaucosan treatments.

Two cases of retrobulbar neuritis were treated with intra-nasal tampons of cocain-adrenalin. In one case the treatment was combined with inunctions of grey ointment, and this case recovered promptly. In the other case two months tamponage improved vision from hand perception or hand movements to 5|50; after two series of mercurial inunctions it rose to 5|15.

Zuckermann-Zicka, Z. Light Therapy in Ophthalmology. *Ofthalmologicky Sbornik*, 1928, V, 2, p. 219.

THE writer is very enthusiastic about the effectiveness of ultra-violet and *x*-ray therapy in eye diseases. In eczematous keratoconjunctivitis she is very successful with ultra-violet irradiation. She irradiates the entire body, except the head, with two lamps, one in front and one behind, every other day. When the treatment ceases to produce an erythema, the irradiations are discontinued for two or three weeks and then resumed again. The eyes should be carefully protected; exposure to light may produce a stubborn and painful conjunctivitis. In tuberculous affections of the uvea she combines ultra-violet irradiations of the entire body with local *x*-ray therapy. In intractable cases of squamous blepharitis and chalazia which resisted every other method of treatment, she obtained good results with an *x*-ray exposure after protecting the eyeball with a glass prothesis. Eighty per cent. of epitheliomas of the lids were cured by *x*-rays. She reports a case of myxoepithelioma of the orbit treated with *x*-rays, in which there was no recurrence after three years.

Armstrong, J. J. P. Radiant light in gonorrhœal ophthalmia. *Physical Therapeutics*, 1928, V, 46, April, p. 159.

USING a deep therapy lamp of 1,500 watts with a white globe, Armstrong treated eighty cases of gonorrhœal ophthalmia, all in the second stage. Smears were examined in thirty-four cases and found positive, the rest being taken for granted from the history. Twelve men had a cloudy cornea and two had beginning marginal ulcers. The average number of light treatments was nine, the light being used twice daily, one hour at a time. The least number of treatments was eight, and the greatest fourteen. At the end of this time all pain, swelling and pus had disappeared, and the patients were discharged with a zinc lotion to be used every two or three hours.

Only the eyes are exposed. The light is applied at a distance of eighteen inches and gradually raised to twenty-five or thirty inches according to tolerance, and left for one hour. This is done twice daily. Compresses of hot Epsom salts in solution are applied at home by the patient himself every fifteen minutes, followed by irrigation with fresh twenty per cent. argyrol every four hours. Other local measures are used as indicated. Relief of pain is prompt and the healing process is speeded up. One illustrative case is reported.

The Morbid Anatomy of Sprue.

By F. P. MACKIE, V.H.S., O.B.E., M.D., M.SC., D.P.H., F.R.C.S., F.R.C.P.,
LIEUTENANT-COLONEL, I.M.S.,
and
N. HAMILTON FAIRLEY, O.B.E., M.D., D.SC., F.R.C.P.

(*Indian Journ. Med. Res.*, January 1929, p. 799.)

SUMMARIZING our experience of the eight autopsies under review, we propose to describe in general terms the post-mortem appearances of an advanced case of sprue.

Most of our cases were Anglo-Indians and, owing to the great objection which this class of patient has to post-mortem mutilation, it was not found expedient to remove the brain and spinal cord or to carry out such a full examination of the skeleton as was required to show the complete distribution of aplastic or hyperplastic marrow in the long bones. As we have never met with clinical

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

evidence of organic disease of the brain or spinal cord or of the peripheral nerves in any case of sprue during life, the omission of these organs from the necropsy would not appear to be a matter of much importance. On the other hand, a limited examination of the osseous system may occasionally lead to erroneous views regarding the real condition of the marrow.

Commentary.

Comparatively little has been written on the morbid anatomy of sprue and many of the most quoted references such as those of Thin (1890), Wethered (1890), Faber (1904) and Justi (1913) have been based on an examination of one or two cases. Faber injected the abdominal cavity of his case with formalin immediately after death and found intestinal ulceration unassociated with atrophy of the gut wall.

On the basis of this observation he explained thinning of the gut wall as being due to distension with gas and atrophy of the mucous membrane as a post-mortem phenomenon dependent on loss of surface epithelium and destruction of villi. Justi in the main supported these conclusions. More recently Faber (1927) has reopened the subject when discussing intestinal atrophy in pernicious anæmia and maintains that when a similar technique is adopted (i.e., the immediate intraperitoneal injection of formalin after death) the signs of intestinal atrophy are absent in this disease also.

The influence of the above-mentioned factors is certainly a matter to be considered and we hope to get an opportunity of investigating the method at subsequent autopsies. Quite apart, however, from the vexed question of thinning of the intestinal wall and its causation, we do not consider that the slow destruction of the epithelium of the mucosa described in our cases can be adequately explained either by meteorism or necrobiotic changes, or by a combination of both factors occurring under tropical conditions.

The most careful descriptions of the morbid anatomy and histology of sprue are to be found in the well-balanced and eminently sane writings of Manson-Bahr (1915 and 1924), whose work should be read in the original. Amongst other things this author rightly points out that cases of sprue which usually come to autopsy represent the terminal condition of the disease, the chronic starvation accounts for many of the late appearances, and that the only hope of discovering the initial and underlying cause depends on studying materials derived from very early cases. He also regards sprue as being primarily a disease of the alimentary tract—a view which we thoroughly endorse.

In addition to intestinal atrophy and nutritional disturbances, we have been impressed with the increase in the hæmolytic bacteria of the intestinal flora and the invasion of the atrophic mucosa with cocci and other organisms. These factors, we believe, result in a state of chronic toxæmia which further increases the aplastic anæmia, glandular deficiencies and other metabolic disturbances described as complicating advanced sprue.

In respect of McCarrison's (1921) researches on the effect of vitamin deficiency as a factor in the production of bowel disease, one of us (F. P. M.) has recently published a paper * on this subject. The condition set up by a complete absence of vitamin C in monkeys produced a state of affairs which cannot be identified with sprue, but that is not to say that subminimal amount of vitamins over a length of time cannot at least contribute to the conditions which we have described in this paper. On this subject we keep an open mind, being well aware from personal observations in Bombay that the incidence of sprue and its distribution in the community are difficult to reconcile with any hypothesis of dietary deficiency unless it be based on decreased absorption rather than deficient intake of vitamins in the diet.

* "The Association of Bowel Disease with Vitamin C Deficiency." *Ind. Journ. Med. Res.*, Vol. XVI, No. 1, July 1928, pp. 77—94.

Summary and Conclusions.

(1) The changes in the tongue are those which have already been described by other observers. The mucous membrane is thinned and atrophic and the lingual papillæ may disappear. There is desquamation of the epithelial layers and occasional loss of tissue amounting to superficial ulceration with little sign of inflammatory reaction.

(2) The changes in the intestine are most marked in the ileum, but are present to some degree throughout the whole tract. They are chiefly those of thinning and atrophy of the mucous membrane with marked degeneration and ultimately the almost complete disappearance of the absorptive and secretory epithelium. Here, again, the change is one of degeneration and aplasia, and if it is preceded by inflammation there is little evidence of such in the terminal stages of the disease. There is evidence of blood destruction in the mucosa, suggesting the absorption of some hæmolytic substance from the intestine and the destruction of blood *in situ*.

(3) The disposition of micro-organisms in the gut wall favours the view that there is *ante-mortem* invasion by bacteria such as is known to occur in conditions of malnutrition due to vitamin deficiency.

(4) A specific atrophy of cardiac muscle out of all proportion to any decrease explicable in terms of mere starvation was noted in two cases of our series. On the other hand, the depreciation in the weights of the other viscera—notably that of the liver, spleen and kidneys—can be explained on the latter basis.

(5) The liver, kidney and the adrenals sometimes show microscopical changes of a degenerative nature such as might be induced by the action of a toxin. Iron pigment is laid down in moderate amount especially in the liver, but not in the same quantities as characterise pernicious anæmia.

(6) The bone-marrow as seen in the femur or tibia shows in most cases marked aplasia. The red marrow where present is much reduced in quantity, though in two instances there was extensive hyperplasia similar to that seen in pernicious anæmia. A moderate grade of hyperplasia was seen in another case. Such findings suggest that in sprue there is a toxin which primarily stimulates and later leads to the exhaustion of the hæmopoietic function so that in the terminal stages of the disease an almost complete aplasia results. This supposition is borne out by the condition of the blood as seen during life.

(7) These and other studies lead us to believe that sprue is primarily a disease of the intestinal tract which, if progressive, results ultimately in degeneration and destruction of the absorbing and secretory tissues and the production of a condition of slow progressive starvation. The absorption of toxins from the damaged mucosa perhaps associated with actual bacterial invasion, appears to be an important factor in the progressive anæmia and other late manifestations of the disease.

REFERENCES.

Thin, G. (1890). Psilosis linguæ et mucosæ intestini. *Brit. Med. Jour.*, June 14, pp. 1357—1361.

Wethered (1890). Psilosis or Sprue. *Trans. Path. Soc.*, London, Vol. XLII, p. 116.

Faber, K. (1904). Ein Fall chronischer Tropendiarrhœa (Sprue) mit anatomischer Untersuchung des Digestionstractus. *Archiv. f., Verdaung-Skrankh*, Vol. IX, p. 336.

Faber, K. (1927). *Lectures on Internal Medicine*, Hoeber and Co., New York.

Justi, K. (1913). Beitrage zur Kenntnis der Sprue (Apthæ tropicæ). *Beiheft. Archiv. f. Schiffs. u. Tropen Hyg.*, Vol. XVII, Beiheft 10, 5—53.

Manson-Bahr, P. H. (1915). *A Report of Sprue in Ceylon.* Cambridge University Press, pp. 130—142.

Manson-Bahr, P. H. (1924). The Morbid Anatomy and Pathology of Sprue and its bearing upon ætiology. *Lancet*, June 7, pp. 1148—1151.

McCarrison, R. (1921). *Studies in Deficiency Diseases.* Oxford University Press, p. 100.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Reviews.

SURGERY IN THE TROPICS.—By Sir Frank Powell Connor, D.S.O., F.R.C.S., D.T.M. & H., Lt.-Col., I.M.S. London: J. & A. Churchill. 1929. Pp. IX plus 293, with 99 illustrations. Price, 12s. 6d.

SIR FRANK CONNOR and the Calcutta Medical College are to be congratulated on this excellent little book, the publication of which is fully justified. It is meant to supplement the teaching of the ordinary textbooks, and the author's objectives, to confine the subject into a reasonably small space, and to present a picture of surgery as practised in the tropics, have been fully attained. The chapters on the surgical aspects of the dysenteries, and of infections caused by parasitic worms and insects, which occupy its greater part are well and clearly written. An excellent account of the various complications of amœbiasis is evidence that much thought and research have been devoted to these affections in Calcutta, while there is a very good description of the puzzling pathology and of the treatment of filariasis. The peculiarities of tuberculosis and syphilis, as met with in the tropics, are concisely and fairly described, and the book also contains a very good account of tropical granulomata. It is a pity that limitations of time and space have not permitted a fuller discussion of the diseases caused by pyogenic and non-pyogenic bacteria and of the influence of diabetes which, more than anything in the tropics, can test a surgeon's capacity. The notes on anthrax (no mention is made of treatment with salvarsan) and on tetanus are disappointingly brief, but we hope to see a more detailed account of these and other surgical conditions in a fuller volume at which the author hints in the preface. The illustrations are many and good, though perhaps the addition of a few more pictures of pathological specimens and slides would have been of great help to the student. The few case reports that are included are excellent, we wish there had been space for more. The book concludes with an interesting appendix of the prevalence of diseases in India, mainly based on a survey attempted by the Calcutta School of Tropical Medicine. Lack of accurate record keeping by any except the larger hospitals in India, render the compilation of such a review extremely difficult, but the tables reproduced give the reader a very good idea of the scope of tropical surgery and complete an extremely interesting and useful volume. The book is very well produced and should prove popular in the medical colleges and schools of the country.

E. W. C. B.

A TEXTBOOK OF MEDICINE.—By Various Authors. Edited by J. J. Conybeare, M.C., M.D. (Oxon.), F.R.C.P. Edinburgh: E. & S. Livingstone, 1929. Pp. XV plus 976 with 16 text illustrations and 8 plates. Price, Rs. 16-14 or 22s. 6d. net. Available from Messrs. Butterworth and Co. (India), Ltd.

THIS latest textbook of medicine by various authors of which Dr. J. J. Conybeare is the editor and part author, aims at steering a middle course between the bulky and at times unmanageable "manuals" or "systems," and the short, snappy and somewhat skimpy synopses. On the whole, it fulfils its avowed mission and it should be popular with students (undergraduate and post-graduate alike) at least in the West. The section on tropical diseases is always the Achilles' heel of textbooks of medicine of Western origin and the volume under review is, to our regret, no exception. It cannot be expected of such a book that it should cover the vast field of tropical medicine even superficially, but such information as it does give should, in our opinion, be approximately accurate and up to date. For example, the statement (on p. 78) that "we have in emetine an absolute specific for amœbic infections" is certainly not true of chronic amœbiasis. Cinchona febrifuge and plasmoquine find no place in the section devoted to the treatment of malaria. The use of tartar emetic in kala-azar, in India at least, is restricted to those cases in which financial considerations prohibit the exhibition of the much more active pentavalent compounds of antimony; nor is the destruction of bed-bugs as suggested on p. 94 likely to reduce materially the incidence of kala-azar.

The remainder of the book is good, although it suffers slightly from that lack of balance which is almost inevitable where different sections are the work of different hands. The sections which particularly attracted the reviewer were those dealing respectively with renal diseases (a short 50 pages only—but wholly admirable) and with diseases of the nervous system. The short chapter on diseases of infants will be found useful, though possibly in future editions a few paragraphs on ophthalmia neonatorum might be considered.

Printing and general format are good and the price is very reasonable.

J. M. H.

LONDON HOSPITAL LECTURES ON FORENSIC MEDICINE AND TOXICOLOGY.—By the late F. J. Smith, M.A., M.D. (Oxon.), F.R.C.P. (Lond.), F.R.C.S. (Eng.). Third Edition revised by George Jones, M.B. (Oxon.), M.R.C.S., L.R.C.P., D.P.H. London: H. K. Lewis and Co., Ltd. 1929. Pp. XX plus 440. Price, 10s. net.

THIS little volume has taken shape from the lectures delivered to the London Hospital students by the late Professor Smith and has been revised and brought up to date by Dr. George Jones. Essentially designed for students preparing for examinations, the subject-matter has been thoroughly crystallised and condensed. This has not handicapped the book in any way; on the other hand, the author is to be congratulated for the clear way in which he has dealt with the whole subject.

In the first three lectures there is a clear exposition of the principles underlying medical jurisprudence. The medico-legal aspect of the law-court proceedings has also been definitely laid down. This section ought to make a strong appeal not only to students, but also to practitioners who are called upon to give evidence in the law courts. Sub-section IV (Lecture VIII) deserves special mention for it gives a concise and yet an explicit description of the ways of testing and giving opinion on blood stains.

The section on toxicology does not appear to have received proper justice at the hands of the author. Classification of the various poisons is not very satisfactory, and in places important things like administration or absorption of poison through wounds have not been mentioned. Snake-bite has not been included and in the section on poisonous plants many poisonous plants commonly found in India and elsewhere have not been mentioned.

The comparative charts scattered throughout the book and the examination questions appended at the end will certainly make the book extremely useful as an examination manual.

R. N. C.

A TEXTBOOK OF UROLOGY.—By Daniel N. Eisendrath, M.D. and Harry C. Rolnick, M.D. London: J. B. Lippincott Company. 1928. Pp. 942, with 700 text illustrations and 11 coloured plates. Price, Rs. 31-8 net (42s.). Available from Messrs. Butterworth and Co. (India), Ltd.

ALTHOUGH expressly written for the general practitioner and the medical student, this is really a book of reference for them. The most useful chapters are those on the genitalia and their diseases. The complaints commonly met with in general practice are thoroughly dealt with. The chapters on the vas deferens, spermatic cord, and epididymis are very complete and thorough. The authors also mention that blood-borne infections of the epididymis are not uncommon, contrary to old ideas. The use of heavier type to lay stress on important points is very helpful. The whole subject has been expressed in brief and comprehensible form. This is a book that can well be recommended for the perusal of surgeons who wish to specialise in urology.

S. N. M.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PHYSIOTHERAPY IN GENERAL PRACTICE.—By E. Ballis Clayton, B.B., B.Ch. (Cantab.). Second Edition. London: Bailliere, Tindall and Cox. 1928. Pp. X plus 231, with 53 figures in the text. Price, 12s. 6d. net.

THIS book, which is a second edition, includes an extra chapter devoted to ultra-violet light, the faradic and galvanic, sinusoidal, diathermic and high frequency currents.

The author has set himself a difficult task in attempting to explain his subject in 226 pages. That he has not been unsuccessful is obvious from the appearance of a second edition in such a short space of time. The book is one whose perusal would well repay any nurse, medical student, or general practitioner who wants to know something of the subject, for the author has succeeded admirably in giving a general survey of physiotherapy.

It cannot, however, be ranked as a textbook, for to attempt to explain electrical treatment in some 17 pages is obviously not only impossible but absurd. For instance, his definition of a faradic current is "an interrupted current which is induced from a primary to a secondary coil to raise the E.M.F." If this statement were given by an unfortunate first year medical student in his degree examination for physics, it would lead to his rapid discomfiture at the hands of his professor.

However, the main part of the book is devoted to exercises, and this is well done, with many helpful diagrams and photographs of patients actually performing the movements. From this point of view the book can be strongly recommended, for the author deals with several diseases and injuries which a general practitioner is constantly seeing, such as tennis elbow, sprained ankle, rheumatoid arthritis, and constipation, to select a few at random.

Altogether the book is certainly worth reading, and is well written. The paper is good, and the general arrangement of the material, with a good index make it easy to look up quickly any particular subject.

J. A. S.

TROPICAL NURSING.—By A. L. Gregg, M.A., M.D., M.Ch., B.A.O. (Dublin), D.T.M. & H. (Lond.), L.M. (Rotunda Hospital). With a foreword by the Hon. Sir Arthur Stanley, G.B.E., C.B., M.V.O. London: Cassell and Company, Ltd. 1929. Pp. XI plus 199. Price, 6s. net.

ONE cannot speak too highly in praise of this book; it is decidedly the best of its kind which one has read.

Every disease that may be met with in the tropics is well described, with all the symptoms and nursing treatment.

To all nurses, both those trained at home as well as those in India, who intend taking up work here one can heartily recommend it.

E. T.
(Lady Superintendent, Medical College Hospitals, Calcutta).

THE PHARMACOPŒIA OF THE KING EDWARD VII MEMORIAL HOSPITAL, BOMBAY.—Compiled by Abraham S. Erulkar, M.D. (Lond.), with the assistance of the Pharmacopœia Committee of the Hospital. Calcutta: Butterworth and Co. (India), Ltd. 1929. Pp. 101. Price, Rs. 2 (Postage extra). Available from the office of the Dean, K.E.M. Hospital.

THE possession of a pharmacopœia of its own is always a necessity in big teaching hospitals, for it has a twofold object—it not only serves the purpose of a book of guidance and reference for students, but it also materially facilitates the work of the attached dispensary in the way of prompt serving of prescriptions. The publication of the new pharmacopœia of the King Edward VII Memorial Hospital, Bombay, will therefore be welcomed. It has been compiled by Dr. Erulkar, M.D. (London), in collaboration with the Pharmacopœial Committee of the Hospital. The compilation of a manual of this nature is not an easy and straightforward task for it involves both chopping and trimming of age-long prescriptions and incorporating formulæ of recent origin. Additions of new prescriptions appear to be few and far between, notable amongst which are Mist. Kurchi Liquid and Infusion Granati Radix—both indigenous drugs of reputed merit. The retention of "Injection Sparteine" in the Pharmacopœia will not probably suit the taste of present-day physicians in view of the fact that recent researches have thrown considerable doubt on its pharmacological action. The omissions, on the other hand, of santonin powder with Pulv. Rhei and Scammony, triple carbonate powder of bismuth, magnesium and sodium and inhalation of Tincture Benzoin Co.—all well-known formulæ—will be resented by many. On the whole, however, the Committee deserve congratulations on having managed the whole affair with judgment and consideration.

The chapter on poisons and their antidotes at the end of the book contains much useful and practical information. The posological table containing the official and non-official preparations in the appendix will be welcomed by students as well as by members of the staff for ready reference in cases of doubt. The Gaubius' table of proportionate doses for different ages, the dentition table, the obstetric table, and the table containing approximate food values in grams per ounce of common articles of food are all features of note and special mention.

The interleafing of the book is a good idea. This further enhances its utility as a pocket book and a constant companion of the medicos, both inside and outside the hospital.

The price, Rs. 2, for a pocket size book of 100 pages is a little high. The Pharmacopœia of the Calcutta Medical College, which is of the same size as this, is priced annas thirteen only.

R. N. C.

HEALTH OF THE SCHOOL CHILD.—By Parmanand Ahuja, M.B., B.S. Karachi: Model Printing Press. 1928. Pp. X plus 75. Price, 6 annas.

THAT "the child is the father of the man" is an age-old proverb which, in other words, means that "the nation marches on the feet of little children." There is no doubt about the nation being moulded in the nursery and the school; and therefore books that help in the proper moulding of the nation, or, in other words, in laying the concrete of its foundation, are most welcome to-day. For, we must confess, especially in this country, that the entire science and, we should add, the art of child education and child guidance based on a right understanding of child psychology and child hygiene are as yet but little known, less understood and hardly studied, it being not yet sufficiently realised in practice that the essential conditions of the advancement of any community are character and health—and both these are planned and settled and built up during the formative years of a child's life. Dr. Parmanand Ahuja's "Health of the School Child" is a helpful study in the line indicated by the title and is a welcome publication. The author has given considerable thought to the study of the subject; and this small book of 75 pages covers an extensive ground of useful and thought-provoking suggestions on such subjects as school sanitation; child hygiene; health of the teacher; eye and eye-sight; brain and body; medical inspection of schools, and a criticism of the present scheme of studies. The book is written in a patriotic spirit and in a preacher's racy and eloquent style, largely embellished by quotations and appeals to the feelings. One might have wished to see the chapters more scientifically grouped and arranged; and as it is mainly written for teachers and parents, a few more factors and principles of child guidance could have been usefully introduced, and the subjects more scientifically and therefore not less eloquently, treated, giving the reasons for the recommendations made. A sudden detailed treatment of the anatomy, and physiology of only one sense organ, the eye, useful and interesting as it is, is a little out of proportion to the general treatment of other subjects. But as we have said, we welcome publications in this line to enable and help teachers and parents and the public to pay greater and better attention to this most important subject, the body and mind of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

boy and the girl, and lift their education out of the narrow groove into which it has fallen; and Dr. Ahuja's book is an excellent little popular book for such educational reform. As it is very moderately priced, it should be within the reach of all, and carefully read and digested by parents and teachers who have the welfare of the child and the nation at heart.

D. N. M.

DISEASES OF THE GALL-BLADDER AND BILE DUCTS.—By E. A. Graham, A.B., M.D., W. H. Cole, B.S., M.D., G. H. Copher, A.B., M.D. and S. Moore, M.D. 1929. London: Bailliere, Tindall and Cox. Pp. XV plus 477 with 8 coloured plates and 224 text figures. Price, 35s. net.

THE diagnosis and differential diagnosis of disorders of the gall-bladder and bile ducts within recent years, thanks mainly to the development of the art of cholecystography, has attained to a much greater degree of precision than ever before. The authors of this excellent book have been prominently associated with the newly discovered knowledge of the gall-bladder and their exposition of the subject appears to be, for the moment, the last word thereon.

The opening chapters of the book deal respectively with the anatomy of the extra-hepatic bile passages and with the physiology of the gall-bladder. The discussion on the lymphatics of the gall-bladder beginning at p. 30 is particularly interesting. This section is taken very largely from an important paper by Sudler published as long ago as 1901 and unaccountably neglected by later workers; Sudler's histological work has radically altered our conceptions of the pathology of cholecystitis. The section headed "Experimental Cholecystography" in Chapter II. also calls for special mention. The technique of cholecystography depends on the observation of Abel and Rowntree (first made in 1909-1910) that the phenolphthaleins as a class are largely excreted in the bile. Graham and Cole, the senior authors of the book under review, following up and extending this observation, showed that when phenolphthalein containing either iodine or bromine is injected intravenously into animals or man, it also is excreted in the bile and a sufficient concentration of the halogen is obtained in the gall-bladder to cast a shadow when exposed to the roentgen ray. From this observation, first made in 1924, the science of cholecystography has gradually grown.

The physiology of the emptying of the gall-bladder is fully discussed and a mass of experimental evidence is adduced to support the view that contractions of the gall-bladder muscle are not alone responsible for this phenomenon. The washing out of the organ by the influx of fresh bile from the liver is probably the most important factor in this process.

The chapter on the pathogenesis of cholecystitis is remarkable chiefly for a satisfying refutation of a commonly accepted view, viz., that cholecystitis most frequently arises from "contact infection" of the mucosa of the gall-bladder from the bile. After an adequate discussion of the whole subject, the conclusion is reached that the majority of cases of cholecystitis in man arise as a result of lymphatic spread from a pre-existing hepatitis. This new conception of the pathogenesis of cholecystitis is intimately related to the histological work of Sudler already mentioned.

Space does not permit of more than a passing reference to the authors' work on gall stones: mention should, however, be made of the interesting historical introduction and of the authors' disbelief in the prevalent conception of the outstanding importance of infection in the ætiology of cholelithiasis.

Chapter VII, comprising just over 100 pages, is in many ways the most important in the book for it gives a complete exposition of the subject of gall tract radiology and particularly of that branch of it which is now known as cholecystography. Physiological principles and technique, the substances used and their modes of administration, the interpretation of results and the contra-indications to the employment of this method of investigation are all subjected to a detailed critical analysis. The fact that no fewer than 108 out of a total of 224 figures are included in this chapter alone, adds still further to the clarification of the subject.

The remainder of the book deals mainly with hepatic function tests and with the surgical treatment of affections of the gall-bladder and bile ducts. With regard to hepatic function tests, the authors conclude: (*a*) that no individual test can be deemed satisfactory on account of the diverse functions of the liver, and (*b*) that the dye tests, including chiefly phenoltetraiodophthalein, bromsulphalein and phenoltetrachlorphthalein together with methods of estimating bilirubin (van den Bergh and icterus index tests) are of most value. By using the first named dye, a combination of cholecystography and hepatic function test can be carried out.

The surgical section calls for no special comment. The authors prefer the radical operation of cholecystectomy rather than the more conservative cholecystostomy whenever the gall-bladder shows definite evidence of disease.

In order adequately to criticise this book, a knowledge of the subject equal to, or greater than, that possessed by Dr. Graham and his colleagues is requisite. Even if we did possess this knowledge we should still find our criticisms included in the contents of the book, for the authors do not confine themselves exclusively to their own particular views but give a fair all-round presentation of the various aspects of the subject discussed.

The only flaw that we detected is one for which the authors cannot be held responsible. We cannot claim to have read this book line by line—albeit the interest of its contents merits it—yet despite this fact we found a relatively large number of printing errors. On p. 85, line 19, "though" should be "thought": the first line of the main paragraph on p. 166 contains a "to" for an "in" while confusion of type in the succeeding 5 or 6 lines makes the context at first sight quite unintelligible On p. 337 in the third line from the bottom, "and" should be "an," while on p. 339 the reference to p. 334 is confusing—p. 344 is meant. The last named page seems to be particularly unfortunate for in it we also find "reticulo-endothelial" masquerading as "reticulo-endoghelial." On p. 350 (line 6) an unwanted "r" has obtruded itself into the word "obtaining," while on p. 357 (line 25), "is one tube" should be "in one tube" Pp. 388 and 389 are also disfigured, the former containing a "with" instead of a "which," while the latter deprives one of its "patients" of a humble but necessary "S."

That we may not be considered neglectful in any particular let us hasten to add that the indexes—for an adequate recognition of which the authors plead in an extract from a 17th century writer—resemble in their excellence the contents of the book in general.

J. M. H.

AIDS TO PSYCHOLOGY.—By J. H. Ewen, M.R.C.S. (Eng.), L.R.C.P. (Lond.). 1929. London: Bailliere, Tindall and Cox. Pp. VII plus 163. Price, 3s. 6d. net.

PSYCHOLOGY is not a subject that lends itself readily to expression in a condensed form, and the author is to be congratulated on presenting even the bare outlines in the limited scope of 163 pages. The subject is treated on conventional lines and obviously owes much—as the author acknowledges in his preface—to the classical studies of Stout, McDougall, Hart and others. The book has been written more particularly with an eye to the needs of those studying for a diploma in psychological medicine; by such students it will doubtless be found useful as a source of quick revision. The Students' Aids Series, to which this is a useful addition, now numbers 40 odd volumes and deals with subjects as far apart as the analysis and assay of ores, metals, fuels, etc., on the one hand and rational therapeutics on the other.

J. M. H.

INSOMNIA AND DRUG ADDICTION.—By P. C. Collingwood Fenwick. London: H. K. Lewis and Co., Ltd. 1928. Pp. XII plus 56. Price, 2s. net. Paper covers.

IN this book the author has given a general survey of drugs of addiction, their symptoms and treatment. The

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

subject has been put in a condensed and easily understandable form to make the publication useful to general practitioners and medical students. The author has briefly described the effects produced by most of the narcotic drugs used for addiction purposes, including opium, morphine and cocaine.

He gives a few simple methods of treatment for the habits and insomnia caused by the drugs. Although he does not go into details of such treatments as recommended by Lamber Town, Scaleth, Pattey and others, his suggestions regarding nursing home treatment are good. The book will be welcomed by medical students especially, who are taught so little about this important subject.

R. N. C.

THE DIAGNOSTICS AND TREATMENT OF TROPICAL DISEASES.—By E. R. Stitt, A.B., Ph. G., M.D., Sc.D., LL.D. Fifth edition, 1929. Pp. XXX 918 with 249 illustrations. London: H. K. Lewis and Co. Price, 31s. 6d. net.

THIS is an old friend in a very new guise. The new edition differs from the former ones chiefly in the absence of the sections in small print, the type being uniform throughout, except in the appendix, and in the thick quality of paper used; consequently in place of the relatively thin volume to which years of use have accustomed us, we have now what is rather a comprehensive and voluminous survey of the whole subject, rather than a student's pocket book.

Dr. Stitt's two well known books have for many years been favourites with students and general practitioners in the tropics. The amount of carefully selected, well arranged, and well indexed information in them is amazing. And the 5th edition of the present volume is much more than a revision; it is almost a re-written work. Special attention should be paid to the author's treatment of yaws, pp. 149 to 173. Here there is a wealth of new illustrations—many of them exceptionally fine ones—an account of the most important experimental work of Schöbl in 1928 on yaws in monkeys, and a review of the possible—if not probable—identity of *T. pallidum* and *T. pertenue*. Fig. 68, after Choisser, shows that yaws may cause severe aortitis, and Fig. 69, after the same author, that it may result in aortic aneurysm. In brief, the position taken up (and one must admit that there is evidence in its favour) is that yaws is infectious syphilis of childhood, and that the Haitian native, who has practically always had yaws in childhood, is protected from syphilis in adult life.

Six new chapters are included in the new edition; on melioidosis; food injuries and vitamin deficiencies; injurious plants; common cosmopolitan helminthic infections; injurious arthropods, fish and coelenterates; and poisonous snakes. The sections on medical and surgical practice in the tropics have been re-written So also has the section on malaria, where the material has been re-arranged, and recent work on plasmochin and the large volume of new knowledge acquired as the result of the treatment of general paralysis by experimentally induced malaria are reviewed. Yellow fever has been transferred to the section dealing with the filtrable viruses, in accordance with recent experimental findings. In the present edition there is also included an appendix in four sections; an index of clinical diagnosis; laboratory procedures—which is brief but very much to the point; an index of essential laboratory procedures; and a section on tropical hygiene. This is the only portion of the book in small type; it constitutes no less than 241 pages of most valuable matter brought into compact compass. The question of residence of Europeans in tropical climates is fully dealt with.

Turning through the book, one is struck with several new features. First of all, the amount of information included is simply enormous; the work is much more than a manual of tropical diseases; it is an account of all the diseases, both tropical and non-tropical, encountered in the tropics. Secondly, the printing, format, and general get-up of the book are an immense improvement on former editions. Thirdly, the illustrations are of very varied degree; some of the old ones to which we have been accustomed for years are not too good, and might well be replaced by better ones; on the other hand, the new edition is important for the wealth of new and admirable illustrations included, especially in the sections on yaws, amœbiasis, leprosy, and malaria. (In a future edition we consider it probable that the author will have to go in for a few colour plates, though the present edition admirably illustrates how much can be done with black and white and half-tone illustrations only.) The well known frontispiece of the malaria parasites really requires colour,—and also deletion of the "parthenogenetic macrogametocyte" of *Plasmodium vivax*.

"Stitt" has long been a favourite with medical workers in the tropics. The present edition is a very great improvement on previous ones, and we have no doubt that it will prove extremely attractive to our readers.

R. K.

BIRCH'S MANAGEMENT AND MEDICAL TREATMENT OF CHILDREN IN INDIA. Seventh edition. —By Lieut.-Col. V. B. Green-Armytage, M.D., F.R.C.P., I.M.S. and Major E. H. Vere Hodge, M.D., M.R.C.P., I.M.S. Pp. 482; illustrated. 1929. Calcutta: Messrs. Thacker, Spink and Co. Price, Rs. 10.

THIS is the 7th edition of a very well-known, not to say famous, book. In 1844 Surgeon Henry Hurry Goodeve of the Bengal Medical Service, realising that in India there were many European mothers situated in remote stations far away from any immediate medical aid for their children in the *mofussil*, wrote the first edition, not as a medical textbook or to replace the necessity for skilled medical attendance, but as a household companion and volume to consult in emergencies. The book immediately became a standard work in India, and has remained such for many decades. Four editions followed within ten years, and in 1872 the book was entirely re-written by Brigade-Surgeon Edward Birch, I.M.S. He was Civil Surgeon of Hazaribagh, later Superintendent of the Presidency General Hospital, Calcutta, and later still Principal of the Medical College, Calcutta. Thus his opportunities for observing the ailments of European children in India were almost unlimited, and the book became even more widely popular than it had been before.

In the new 7th edition Colonel Green-Armytage and Major Vere Hodge have not attempted a revision; they have completely re-written the entire volume, which is now expanded to a compass of 482 pages, with several illustrations. The senior author has for many years been especially associated with obstetric work and the diseases of children in India, whilst the specialist knowledge of their brother workers in Calcutta on different lines of work has been fully culled from (and freely acknowledged) by both authors. The result is a work which is authoritative, most eminently practical, and one which will be invaluable not only to European mothers in India, but to educated Indian mothers as well; for it covers a very wide field.

There are no less than 58 chapters in the book, and it is one which it is almost impossible to review. Introductory sections deal with infant mortality in India and the pros and cons of bringing up European children in this country. The mother's health during pregnancy is then fully dealt with, and here full dietetic instructions are given for the expectant mother, based upon the senior author's many years of study of the requirements and conditions. Chapter IV deals with the management of the infant from the day of its birth, and Chapter V with nursing and allied topics. Sections on diet in childhood, artificial feeding of infants in India with special reference to Indian conditions, and dentition and its management follow. A chapter on rickets and scurvy follows, in which the preventive line of treatment is fully detailed. The general hygiene and morbid habits of childhood are next discussed, and there follows a chapter on the modes of spread of the diseases of children. Chapter XIII on the examination of sick children is particularly full and detailed, and may be studied with as much profit by the medical practitioner

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PITUITARY EXTRACT B.D.H.

(Posterior Lobe)

Pituitary (Posterior Lobe) Extract B.D.H., which is an accurately-standardised sterile solution of the active principle of the posterior lobe of the pituitary gland, has been used successfully in obstetrics, in the later stages of labour (to stimulate uterine contractions), for induction of labour at term, for control of ordinary haemorrhage, and for the treatment of intestinal stasis and heart failure.

Pituitary (Posterior Lobe) Extract B.D.H. is entirely British made; it is manufactured in the B.D.H. laboratories from carefully collected and dissected glands, and every batch is standardised for uterine contraction in accordance with the Therapeutic Substances Regulations, 1927; also, before issue, it is submitted to a blood-pressure test.

The employment of Pituitary (Posterior Lobe) Extract B.D.H. in the ordinary course of practice by a continually-increasing number of physicians is due to the fact that it never varies in composition or in activity.

A physician using it regularly knows exactly the amount necessary to produce a desired reaction. Its reliablity inspires and justifies confidence.

Descriptive literature will be sent on request to either of the B.D.H. resident representatives:—

HENRY S. CLARK,
8-10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Buildings,
Parsee Bazar Street,
Fort, BOMBAY.

THE BRITISH DRUG HOUSES LTD
LONDON

Pit/Ext/In/297

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"TRADE MARK NORMACOL" BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

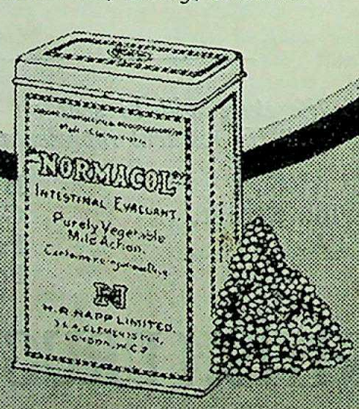
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co. Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H. R. NAPP LIMITED.

3 & 4, Clements Inn, London, W.C.2.

Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two Lines)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

as by the mother. The chief causes of fever in children in India are then discussed, and the authors next proceed to a consideration of the principal diseases of children in India.

The senior author lays special stress on *B. coli* infections in young children in India, and considers this condition to be one of the most important causes of obscure fever in such subjects. The common and world-wide febrile affections of children are then considered, and fevers peculiar to the tropics are next dealt with. We are very emphatically in agreement with the authors' recommendation that, after the malarial fever has been controlled by quinine, a course of iron and arsenic treatment should follow; this is essential to build up the damaged hæmopoietic system, and neglect of it may lead to relapses. In brief, use quinine to sterilise the infection as far as possible, then iron and arsenic to build up the body resistance; it is an old rule, and one which all clinicians of experience in India are well aware of. "Quinine for three months" should to-day be replaced by quinine for three weeks, followed by iron and arsenic for one month or longer.

Sections follow dealing with diseases of the nervous system—a most important subject in young children, with diseases of the throat and lungs, and the authors next consider that bane of infantile life—diarrhœa and dysentery. Here the instructions given are admirable, and will enable the nursing mother or the mother of an older child to treat the condition intelligently and even with success in the absence of professional medical aid. "Abdominal pain in childhood" is a well constructed chapter, dealing with the causes which are not important, and contrasting those which are. A consideration of infantile jaundice then leads to a very well written chapter on that mysterious disease of infants in the tropics—"infantile liver." Here the dietetic and hygienic rules laid down are admirable. Diseases of the skin, eye, ear, and local systems are then dealt with, injuries of different sorts and poisons. Even insect stings and snake-bite are discussed. A most useful chapter on the administration of remedies to young children is followed by an appendix on the preparation of special diets and prescriptions for young children.

Undoubtedly the authors have done their work extremely well, and this book is one which every European (and, for that matter, Indian) mother should not be without. It is an invaluable *vade-mecum* for the class of reader to whom it is intended to apply. It emphatically does not attempt to replace resort to skilled professional attendance, which is to-day far more universally available than when its first edition was planned. But to the anxious mother in the *mofussil* it will be a sound and intelligent guide.

Throughout the book on almost every page the authors have resorted to the use of heavily leaded type for important instructions; even in places to leaded capital type. This makes the book one which is very easy to consult. On the other hand, it makes it less readable in general, though the chief value of the book will be as a ready help in times of trouble rather than as a volume for leisure hours.

The authors of this new edition have done their work well, and many an anxious mother in India will find this book a most valuable stand-by in times of distress and anxiety.

R. K.

OBSTETRIC FORCEPS: ITS HISTORY AND EVOLUTION.—By Dr. Kedar Nath Das, C.I.E., M.D., Professor of Midwifery and Gynæcology, Carmichael Medical College, Calcutta. Pp. 903, with 878 illustrations. 1929. Calcutta.: The Art Press. Price, Rs. 30; Foreign, £2 2s.

DR. KEDAR NATH DAS has for several years been the doyen of the medical profession in Calcutta, and this admirable and most interesting monograph is what we should have expected of him—erudite, of great historical interest, and with an appeal to a wide circle of readers, to those interested in the history of obstetrics as well as to the practising obstetrician. The compilation of the materials for this book was commenced in 1917; and some idea of the enormous labour involved in writing it may be gained from the statement that it includes no less than 2,072 references to the literature, from the earliest dawn of obstetric history to the present date. Every possible source of material has been studied and the result is a complete monograph, historical, complete, and noteworthy. Finally, a word of praise should be said with regard to the printing, illustration, and binding of the book, which are all excellent for an Indian press.

The subject-matter of the book falls into six main sections; the pre-Chamberlen period; the Chamberlens, 1601—1818; the 19th century; and the 20th century; together with subsidiary chapters dealing with the classification of forceps, chronological tables of forceps, and the obstetric forceps in allegory, literature, and art.

It is clear from a study of the Ayurveda—1500 B.C.—that the ancient Hindus used two, if not three, instruments for facilitating delivery of a dead fœtus, but all appear to have been intended for dismemberment of the dead fœtus rather than for the delivery of a living one. Hippocrates, of whom a wonderful composite portrait which shows the "father of medicine" apparently in a contemplative mood is given on p. 12, and Soranus of Ephesus both describe instruments for embryotomy, and a traction hook and ring knife are figured on p. 14 from the Naples Museum. Avicenna, 980—1030 A.D., a celebrated Arabian obstetrician of Bokhara, apparently delivered living children with a rudmientary type of forceps, but appears to have more usually used it for embryotomy. Ambroise Paré, 1549, used a rudimentary cranioclast, not very unlike the instrument of the present day. About this time universal resort was apparently had to hooks of different patterns in cases of difficult delivery, with the result that the fœtus was always delivered dead, and usually dismembered. Amand used a net with attached tapes by which traction could be exerted on the head.

The real inventors of the modern obstetric forceps were the family of the Chamberlens, 1602—1818. Of these there were several generations, and the original William Chamberlen with his wife and children were Huguenots who fled from Paris to England in 1569. In Section II of the book, Dr. Kedar Nath Das gives us a most interesting historical account of this family, illustrated with old-fashioned woodcuts. One of them—it does not appear to be certain which of the many in the long family line—invented the obstetric forceps, and the mode of construction and use of this instrument remained a family secret for two or three generations. Hugh Chamberlen, senior, born 1630, mentions this family use of an apparatus for the safe delivery of living children as a family secret. Hugh Chamberlen, junior, 1664—1728, is buried in Westminster Abbey. The type of forceps used by the Chamberlens was the precursor of all present-day instruments; it was for direct traction, with notched handles to fit into one another, the union being strengthened by binding the joint around with tape.

Hugh Chamberlen, junior, visited Holland in 1693, and there appears to have entrusted his secret to a certain Roger Roonhuysen, who at once formed a commercial syndicate for the use of obstetric forceps, and for the next sixty years made money out of it. A certain Rathlaw in 1732 refused to purchase Roonhuysen's secret, but obtained a pattern of the forceps through the agency of a student of the latter, who was present at a confinement attended by Roonhuysen, when the latter was suddenly called away by the burgomaster and inadvertently left his forceps behind him. Rathlaw published a full description of the instrument, whose construction was now no longer secret. Later on he tried to sell the secret to the French, but by that time it was no secret. The lever principle was introduced into the forceps by Jacque de Bruin, a pupil of Roonhuysen's.

Coming to the 18th century, a distinguished surgeon-accoucheur named Palfyn, 1650—1730, appears to have independently hit on the idea of seizing the head of the presenting fœtus with two spoon-like instruments, one applied on either side. He demonstrated the use of this instrument to the Academie des Sciences in Paris in 1723. At first the handles of the two spoons were bound

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

together by a napkin, but later a mobile hook or ring was employed.

From these beginnings the use of obstetric forceps became universal, and many and repeated improvements were introduced. These are dealt with by Dr. Kedar Nath Das in the main sections of the book. By 1746 medical schools all over Europe were practising with several patterns of forceps, which in general resembled one another, the chief discussion centering around the best method of locking the handles. Levret, 1747, introduced the pelvic curve to the blades. Smellie, 1752, introduced the long forceps with a pelvic curve. It was apparently not until 1840 that the idea of axis traction was introduced into the forceps—by Hermann, and his forceps were such that traction on both the main and the subsidiary handles had to be employed simultaneously. Simpson, 1811—1870, used both short and long forceps. Hubert, 1860, first clearly enunciated the law that the direction of traction must coincide with the line which constitutes the axis of the blades of the forceps, i.e., axis traction; and this was soon followed by the application of "tractors" to the blades of the forceps themselves, especially by Laroyenne in 1875. Tarnier, 1877, appears to have been the first to apply steel tractors with a separate handle to the blades themselves; and it appears to have saved his general practice from ruin. The principle of the traction rods now became established.

Many minor improvements followed; and, as is well known, Dr. Kedar Nath Das has himself devised two types of "Bengal forceps," designed to fit the curves of the average Bengali woman, one a short type, the other with axis traction; these are illustrated and described on pp. 701 and 702. Still later modifications are such as that of Beck, 1916, in which the cephalic portion of the blades becomes mobile by turning a key placed in the bottom of each handle. By this arrangement one or both blades can instantly be either fixed or liberated; and the blades can rarely slip, even when faulty traction is applied.

Appendices in the book deal with measurements of the many different types of forceps described, whilst Section XI deals with the obstetric forceps in allegory, literature, and art. A Polish book on midwifery, published in 1778, shows an angelic *dai* attending a labour case, with a very fat Cupid bringing her a forceps. Laurence Sterne in *Tristram Shandy* has quite a lot of delightful writing about Dr. Slop and his methods of midwifery—here quoted, especially the passage where "my uncle Toby" presented his clenched fists to symbolise the fœtus and had them badly bruised by Dr. Slop's application of forceps. Even French political caricature has resorted to the obstetric forceps in illustrating the birth of the Empire.

Truly a delightful and most interesting book, replete, scholarly, well devised, well written, and of very great historical interest.

R. K.

DISEASES OF INFANTS AND CHILDREN.—By H. D. Chapin, A.M., M.D. and L. T. Royster, M.D. Sixth Revised Edition. London: Bailliere, Tindall and Cox. 1928. Pp. XV plus 675, with 10 plates and 184 figures in the text. Price, 30s. net.

THIS book was first published twenty years ago and the appearance of a sixth edition is proof of its popularity and usefulness.

The authors have succeeded in their aim, to present the subject in as compact a form as may be compatible with thoroughness.

The greater part of the book deals with the diseases of infants, and in this section the feeding of infants is described at length with care and accuracy.

An interesting subject is the ketogenic diet treatment of epilepsy in children.

During the last three years 35 per cent. of cases so treated have shown complete cessation of attacks.

The book is very well produced and profusely illustrated. There is little doubt that its popularity will continue.

H. H.

SURGICAL PATHOLOGY.—By C. P. G. Wakeley, F.R.C.S. (Eng.), F.R.S. (Edin.) and St. J. D. Buxton, M.B., B.S. (Lond.), F.R.C.S. (Eng.). Bristol: John Wright and Sons Ltd. 1929. Pp. XVI plus 904, with 392 illustrations, many of which are fully coloured. Price, 45s. net.

MOST of the textbooks on general surgery devote a great many pages to pathology, but there are very few books that deal entirely with the pathology of surgical conditions.

In their preface the authors state: "The aim has been to put forward such an account of the pathological side of surgery as may help readers with their clinical work." They have succeeded in this aim and have produced a book which, properly used in the museum, will be of the greatest help to students.

There is nothing new in the arrangement or presentation of the subject.

The greater part deals with special pathology, but a portion necessarily touches on general pathology.

The authors write with a remarkable clearness and the descriptions are concise.

The illustrations are new and extremely good, above all they illustrate accurately the descriptions in the text.

It seems doubtful whether the coloured pictures of tubercle bacilli in pus (p. 70), or of gonococci (p. 88), are necessary in a work of this calibre.

This book should be available in every medical school for reference and for use in the museum. There is no other that can take its place.

It will prove invaluable to all who contemplate sitting for the higher surgical examinations, but we cannot justifiably recommend it as a necessity to the Indian student who is working for a pass degree. He is already overburdened with expensive books.

H. H.

A LABORATORY MANUAL OF PHYSIOLOGICAL CHEMISTRY.—By D. Wright Wilson. London: Bailliere, Tindall and Cox. 1928. Pp. 272. Price, 16s. net.

THIS is a revised edition of the book formerly written jointly by the present author and Professor Walter Jones and is chiefly intended as a guide to students for laboratory work. The book is divided into two portions. Part I treats of inorganic constituents such as phosphorous, calcium, magnesium, sulphur, etc., standard acids and alkalis, electrolytic dissociation, colloids, carbohydrates, proteins and fats. All these have been clearly described within the short space of about 46 printed pages, of which 10 pages have been usefully devoted to the discussion of electrolytic dissociation. The student, it is hoped, will get much help from the perusal of these chapters, especially when preparing for examination.

Part II of the book deals with body-tissues and fluids, such as bone, muscle, the cell nucleus, saliva, gastric and pancreatic juices, blood, urine, etc. In the section on quantitative gastric analysis, the author has only described tests for estimating the total acidity and free HCl of strained gastric juice; but in view of the fact that quantitative gastric analysis after a test-meal is thought to be of great value in the diagnosis of peptic and gastro-duodenal ulcers, gastric carcinoma and other allied conditions, we should have liked to see a separate section devoted to a more detailed description of the recent tests (including the fractional test-meal) for these pathological conditions. In the section dealing with pathological urine, the author has described the main pathological items such as albumin, glucose, acetone, aceto-acetic acid, bile and blood. In the case of blood in the urine, the author has only described the old guaiacum test, but the recent tests such as the benzedine and pyramidon tests, etc., have not been mentioned. Quantitative methods of analysis of total acidity of urine, total nitrogen, urea, ammonia, uric acid, creatinine, chlorides, inorganic phosphates, inorganic sulphates, total sulphur, sugar, etc., have all been described and this will be very useful to students. A short section dealing with the detection of the common drugs in the urine, as also the analysis of urinary calculi would have been a very useful addition.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Bowel Infection

and the

DERMATOSES

It has long been recognized by dermatologists that absorption of bacterial products from the intestines is the key to many skin troubles. In other words, a large number of dermatoses are symptomatic of bowel infection due to alimentary toxæmia. In the treatment of all such symptomatic maladies of the skin, a new era has been opened up by the discovery of the benzene derivative Dimol.

With the introduction of Dimol, the *bactericidal equivalent* of 140 grains pure phenol can be administered four or five times a day without affecting the mucosa or producing any toxic effect whatever. Dimol is a powerful bactericide—thirty-five times more efficient than pure phenol; it destroys the causal agents of infection and putrefaction—*it does not merely inhibit their growth.* Dimol is not absorbed; after doing its work it is voided with the fæces.

Excellent results have been reported from the use of Dimol on psoriasis, acne, urticaria, purpura, infantile eczema and other skin disorders. The dermatologist who wishes to push his investigations into the fascinating subject of the relation of the alimentary toxæmias to skin troubles is now furnished with a powerful weapon of research. It is of importance that all medical men should realise that intestinal disinfection is now an accomplished fact.

After long and thorough investigation, Dimol pulverettes are now supplied by the Admiralty for use in His Majesty's Ships and Royal Naval Hospitals.

DIMOL LABORATORIES, LTD.,

40, Ludgate Hill, London, E.C.4.

Dimol may now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUINING TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

***Vide* Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.**

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

One inconvenient feature of the book which strikes us most is the absence of an alphabetical index which will prove a serious handicap to the reader. We should certainly like to see it supplied in the next edition.

Apart from the few drawbacks mentioned above, the book will prove to be a most useful aid to students in their laboratory work and we would gladly recommend it to them as such.

J. P. B.

Annual Reports.

SIXTIETH ANNUAL REPORT OF THE DIRECTOR OF PUBLIC HEALTH OF THE UNITED PROVINCES OF AGRA AND OUDH FOR THE YEAR ENDING 31ST DECEMBER, 1927. BY LT.-COL. C. L. DUNN, C.I.E., D.P.H., I.M.S., DIRECTOR OF PUBLIC HEALTH. ALLAHABAD: SUPERINTENDENT, GOVERNMENT PRESS, U. P. PRICE, Rs. 3-8.

As usual, Col. Dunn's report gives a large volume of information regarding public health affairs in the United Provinces.

General Population—Vital Statistics.—The provincial birth and death-rates shown in the report have been calculated on a population of 45,375,787 which is according to the census of 1921 and excludes the population of the Indian States of Rampur, Tehri-Garhwal and Benares.

As stated in previous years' reports, prompt reporting, and the accurate registration of vital statistics are the basis of all public health work, but on account of the illiteracy of the chaukidars, who are the recording agency in rural areas, the figures furnished by them provide but a very rough idea of the state of the public health of the province. In order to improve the existing conditions, various measures are adopted in the districts staffed with rural public health establishments.

The provincial birth-rate for the year 1927, showed an increase of 2.52 over that of the preceding year and of 2.74 over the quinquennial average—the rates for the two years and for the quinquennial period being 36.72, 34.20, and 33.98 per mille of the population, respectively. The provincial death-rate for the year was 22.59 *the lowest on record* as against 25.10 in 1926 and 25.31, the quinquennial average. The low death-rate is chiefly due to low mortality under the head "fevers." The fall in the general mortality may to some extent be due to under-reporting, but the low death-rate combined with the increased birth-rate clearly points to the healthiness of the year.

The total number of births recorded during the year under report was 1,666,479, giving a birth-rate of 36.72 as against 1,552,054 and 34.20, respectively, in the preceding year. The quinquennial average was 33.98. The highest birth-rate (3.93) was recorded in October and the lowest (2.16) in each of the months of May and June.

The number of males born to every 100 females born was 112.27 or practically the same as in the preceding four years.

The total number of deaths recorded during the year under report amounted to 1,025,075 of which 550,457 were males and 474,618 females, the resulting rates being 22.59, 23.14 and 21.98 respectively. The corresponding figures and rates for the preceding year were 1,138,884; 610,233; 528,651; 25.10; 25.65; and 24.49 respectively. The mean ratio of deaths per mille of population during the previous five years was 25.31. The year's death-rate was *the lowest on record.*

According to months, the highest death-rate from all causes (2.32) was recorded in June and the lowest (1.64) in March.

During the year under review, the mortality among infants as among adults was the lowest on record. The information so far received from Medical Officers of Health employed in municipalities shows that out of 949 deaths reported as due to tetanus, 748 deaths were verified by them and only 497 were found to be actually due to this cause. The municipalities of Naini Tal, Mussoorie, Dehra Dun, Hardwar, Bareilly, Moradabad, Agra, Hathras and Jhansi reported no deaths from this cause.

The provincial infantile death-rate of 1927 (151.75) *was the lowest recorded.* As in 1926, twenty-five districts returned infantile death-rates above, and twenty-three below, the provincial average.

During the year under report, the incidence of mortality among infants was highest in the month of September (25,625) and lowest in the month of March (15,330).

In 1927, the death-rate by classes was 24.05 amongst Muslims, 22.56 amongst Hindus, 6.96 amongst "other classes" and 4.20 amongst Christians.

The total number of still-births registered during the year under review was 14,612 against 13,948 in the preceding year, indicating an increase of 664. Among the districts returning the largest number of still-births Gorakhpur, as usual, easily stood first with 3,524.

The district medical officer of health ascribes this fact to the defective reporting by chaukidars who in a very large number of cases report deaths after child-birth as still-births.

During the year under report, as many as 3,147 deaths (which occurred within the limits of the practice of Government Medical Officers as well as in the medical institutions) were verified by civil surgeons and their subordinates.

By far the largest number of these deaths (2,007) was, as usual, returned as due to "all other causes." Next in order came pneumonia (376), tuberculosis of the lungs (219) and dysentery (181). Tuberculosis of other organs claimed 67 deaths, malaria 61, cholera 50, all other infective diseases 38, and tetanus 35. Enteric fever was responsible for 21, syphilis for 18, and pyrexia of uncertain origin for 17. Deaths from plague, kala-azar, beriberi, rheumatic fever and rheumatism, gonorrhœa, smallpox, influenza and leprosy numbered between 3 and 15. No deaths were recorded under heads relapsing fever and scurvy. Of the 3,147 deaths 400 were among children, 1,996 among adults from 16 to 45 years of age and 751 among adults of 46 years of age and upwards.

In 1927, the vaccination staff tested 703,277, entries of births and 512,057 entries of deaths or a total of 1,215,334 entries, as compared with 1,120,831 in 1926, showing a very satisfactory increase of 94,503. The percentages of omissions discovered in respect of births and deaths were 0.95 and 0.55, respectively.

History of the chief diseases.—During the year under report, *cholera* was responsible for 28,285 deaths, giving a ratio of 0.62 per mille of the population against 6,166 and 0.13, respectively, in 1926. The mean ratio for the previous five years was 0.38. The largest number of deaths (9,328) occurred in June and the smallest (10) in January.

In eleven districts the mortality from cholera was above the average for the province (0.62).

The year 1927 being a *Kumbh* year it was anticipated that cholera would prevail in the district of Garhwal and the first case which occurred at Bijni Chatti was imported from Hardwar. This was followed by successive outbreaks of cholera on the pilgrim route from which infection was carried into the interior of the district. Altogether 1,102 deaths in the district and 11 deaths on the pilgrim route were reported to have occurred against 5,527 deaths during the last *Kumbh* year; Barahsyun sub-division remained practically free from the disease while only a few sporadic cases were reported from Lansdowne sub-division. Prompt measures were taken to check the spread of the disease and the energetic efforts of the local and provincial public health staffs brought the disease under control. As many as 12,873 anti-cholera inoculations were performed. Leaflets containing simple rules of sanitation and precautions against cholera were also distributed through sanitary inspectors and vaccinators. The

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

special anti-cholera scheme was continued in the Garhwal district.

The death-rates from cholera in the urban and rural areas in 1927 were 0.29 and 0.65, as against 0.09 and 0.14, respectively, in the preceding year.

The total number of deaths registered from *smallpox* during the year under report was 7,894 against 12,020 in the preceding year, showing a decrease of 4,126. The death-rates for the two years were 0.17 and 0.26, respectively, and the average for the previous five years 0.11. 1,497 deaths occurred among children under one year and 3,308 between one and ten years. The highest number of deaths (1,243) was recorded in May and the lowest (82) in November.

Of the 90 towns, 24 were altogether free from the disease while in 43 the number of deaths did not exceed ten.

The mortality from smallpox in urban areas in 1927 was 0.34 per mille of the population and in the rural tracts 0.16 as against 0.86 and 0.22, respectively, during the year 1926.

15,570 deaths occurred from *plague* in 1927 against 57,297 in 1926, the death-rates during the two years being 0.34 and 1.26, respectively. The quinquennial mean was 1.14.

Out of 90 towns, 32 suffered from the disease, the highest mortality being noticeable in Aonla (18.12), Shahabad (11.93), Ujhani (7.24) and Lakhimpur (4.76).

Throughout the year over five lakhs of rats were trapped and killed. In Agra there was a severe epidemic of plague from February to May, 1926, and the anti-rat campaign was started for the first time in July, 1926. Both officials and non-officials were doubtful of its success in view of the objections raised by sentimental people. The system adopted in Agra has, however, not only proved effective but highly successful, inasmuch as the endemic foci were eradicated and the most orthodox and sentimental people who would not kill a fly, started catching rats in their own houses. With the exception of Bareilly where a few cases of plague occurred in February and March and where the anti-rat campaign was stopped by the municipal board for some months, none of the above mentioned places were visited by plague, although in the previous year or two plague raged there in an epidemic form.

It is hoped that under the medical officers of health the anti-rat campaign will not only prevent the outbreaks of plague but will successfully check its spread in cities if the disease is imported from infected neighbouring towns or districts.

The death-rate from plague in urban areas was 0.43 against 2.14 in the last year. In the rural areas it was 0.33 against 1.20.

Fevers claimed 786,552 deaths in 1927 against 867,939 in 1926. The death-rates for the two years were 17.33 and 19.13, respectively, and quinquennial average 19.31. The largest number of deaths was recorded in June and the smallest in March.

According to the sub-classification, 680,618 deaths were accounted for by malaria, 4,874 by enteric fever, 14,208 by measles, 83 by relapsing fever, 188 by kala-azar and 37,817 by other fevers. These figures are, however, not reliable for the reasons given in previous years' reports.

During the year under review the mortality from fevers in urban areas was 16.19 and in the rural tracts 17.41 as against 18.47 and 19.15, respectively, in the preceding year.

During 1927, the recorded number of deaths from relapsing fever, enteric fever and kala-azar was 108, 6,797 and 203, respectively, as against 716, 10,266 and 151, respectively, in 1926.

Special reports received from the civil surgeons and district and municipal officers of health show that there was no epidemic of *relapsing fever* during the year under report in any district.

A further sum of Rs. 3,000 was paid by the local government as their share of expenses required in connection with the Commission appointed by the Government of India in 1924 to enquire into the origin and progress of kala-azar and the measures necessary to combat the disease.

During the year under report, only sporadic cases of influenza occurred in some districts.

The joint secretaries of the anti-tuberculosis league, Lucknow, report that during the year under review, the subscriptions paid and promised for the establishment of a special tuberculosis hospital in Lucknow amounted to Rs. 83,649 and the amount actually in hand was Rs. 67,377. Strenuous efforts are being made to raise more funds.

During the year under report the number of deaths caused by *dysentery and diarrhœa* was 12,186 against 12,120 in 1926, the corresponding death-rates for the two years being the same, viz., 0.27. The quinquennial mean was 0.25. May recorded the maximum number of deaths (1,456) while February returned the minimum (506).

Five towns out of 90 are reported to have enjoyed immunity from these causes while in 14 the number of deaths did not exceed ten. This is probably due to defective reporting.

The urban and rural death-rates from these causes in 1927 were 2.14 and 0.13 as against 2.41 and 0.11, respectively, in 1926.

During the year under report *respiratory diseases* were responsible for 29,028 deaths, yielding a death-rate of 0.64. The corresponding figures for the preceding year were 30,260 and 0.67, respectively. The average for the previous five years was 0.60. The highest mortality was recorded in January and the lowest in July.

The urban mortality from respiratory diseases in 1927 was 6.95 and the rural mortality 0.19 as compared with 7.22 and 0.21 respectively, in 1926.

During 1927, deaths ascribed to *injuries* numbered 20,419, as compared to 21,670 deaths in the preceding year. Of these 1,789 were suicides: 13,207 were due to wounds or accidents. Snakes and wild beasts were responsible for 5,031 and rabies for 392.

During the year 1927, 125,141 deaths from *all other causes* were registered as compared with 131,412 in 1926. The death-rates for the two years being 2.76 and 2.90, respectively.

During 1927, deaths from child-birth numbered 1,518 as against 1,817 in 1926.

A scheme drawn up in consultation with the Principal, King George's Medical College, Lucknow, for the establishment of a centre for free treatment of venereal diseases in Lucknow was submitted to government and is under their consideration. Literature on venereal diseases is in the course of preparation by the United Provinces Hygiene Publicity Bureau.

Water Supplies.—Statements indicating the results of the chemical and bacteriological analyses of municipal water supplies for the year 1926-27, were submitted to the Board of Public Health, United Provinces. The results in Dehra Dun, Mussoorie and Muttra were bad. To improve the water supply at Dehra Dun arrangements are in train for installing a chlorinating plant at the source of supply and better results are thereby expected. The Superintending Engineer, Public Health Department, has been asked to make enquiries into the bad results in Muttra and Mussoorie.

Anti-mosquito Work.—Anti-mosquito work in Lucknow was organised by the Provincial Hygiene Institute and the Assistant Director of Public Health (Malariology) in co-operation with the Municipal Board, Lucknow. The students of the D.P.H., L.P.H., and Sanitary Inspector classes were allotted to the various wards and they made a detailed survey of the breeding-places of mosquitoes all over the town and later supervised the weekly oiling of depressions where breeding was taking place.

Research Work.—The research work in plague and cholera, which started in 1926 with the help of the Indian Research Fund Association, was continued during 1927.

Plague Research Work.—The inquiry regarding the comparative transmission of plague by *X. cheopis* and *X. astia*, to which reference was made in the last year's report, was continued by Dr. A. N. Goyle, M.B., Ph.D., financed by the Indian Research Fund Association at a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Arcanol

Schering

AGAINST

Influenza

Arcanol is composed of aceto-salicylic acid and the methyl ester of Atophan. It possesses in a high degree the well-known anti-infectious and antifebrile virtues of aceto-salicylic acid as well as the far-famed antiphlogistic and anti-rheumatic qualities of Atophan. These properties signalise Arcanol as the remedy par excellence against influenza and its complications, angina, catarrhal affections of the upper respiratory tracts, scarlatina, etc. It will be found most convenient to administer Arcanol in daily doses of from 3 to 4 tablets after meals. Original packing: Tubes containing 10 tablets of 15 grains. Samples and literature will be gladly sent to medical men on application to:

SCHERING-KAHLBAUM (INDIA), LTD. CALCUTTA

Telephone: Cal. 4770
Telegrams Aeskulap
4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

2044501 **F. SCHWERZMANN & CO.,** Rangoon (Burmah): 26, Merchant Street.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ALLONAL Trade Mark "ROCHE" Trade Mark

The modern remedy for insomnia and pain. Quick in action. Suitable for young and old. Not subject to D. D. A.

DIGALEN Trade Mark "ROCHE" Trade Mark

A really dependable Digitalis preparation, constant in composition, well tolerated. Given orally, intramuscularly, intravenously.

SIROLIN Trade Mark "ROCHE" Trade Mark

An improved Thiocol syrup containing but one drug: Thiocol "Roche" the well-known, safe remedy for affections of the respiratory system.

The above products are available in the following Packings:

Allonal 'Roche': Tablets in bottles of 12 and 100
Digalen 'Roche': Solution in bottles of 15 c.c.
Tablets (oral) in phials of 25
Ampoules in boxes of 6 and 12
Sirolin 'Roche': In 6 ounce "Roche" bottles only.

F. Hoffmann-La Roche & Co., Ltd.,

Basle, Switzerland.

Agents for India and Ceylon:

VOLKART BROTHERS

P. O. Box 606, Calcutta **Colombo** **P. O. Box 199, Bombay**
P. O. Box 22, Karachi **P. O. Box 45, Madras**

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

cost of Rs. 36,437. The results of his investigation have been incorporated in a paper published in the April number of the *Indian Journal of Medical Research*, 1927, under the title "Comparative Experiments on the Transmission of Plague by Fleas of the Genus *Xenopsylla* (*cheopis* and *astia*) with a Discussion on the Flea-Species Distribution in its Relation to the Incidence of Plague." The experiments as detailed in this paper tend to show that *cheopis* is a much more efficient vector of plague than *astia;* for out of fifty-two experiments in which *cheopis* was used, successful transmission occurred in twenty-five, while under exactly the same conditions only nine out of fifty-two experiments were successful with *astia*.

Cholera research work. The observation area.—This year (1927) completes the first year of the existence of the cholera research in the United Provinces carried on by Dr. Saranjam Khan, M.B., B.S., D.P.H. (U. S. A.), D.T.M. & H. (London), and financed by the Indian Research Fund Association at a cost of Rs. 29,409. For the purposes of the inquiry, in order to be able to carry on experimental work in the field, it was desirable to select a suitable area in these Provinces, i.e., an area showing a heavy and persistent infection with this disease. The district of Gonda was selected; this district shows a high death-rate from cholera and has never been free from it for a single year out of the 50 years of available records (1877-1926).

From 25th August, 1927, to the end of November, 1927, a total of 2,631 samples of water were examined. Non-agglutinating vibrios were isolated from 40 per cent. of sullage water, 39 per cent. of tank and lake water, and 31 per cent. of well water.

Sixty-five per cent. of the stools of healthy people showed the presence of non-agglutinating vibrios.

Research work in pilgrim centres.—Research work was carried on with laboratories on the spot in the Dadri fair in Ballia district, the recent *Kumbh* Fair at Hardwar and the *Magh Mela* of Allahabad.

Work in Hardwar was started during the middle of the month of February and is still in progress without interruption.

Cinema films on health subjects.—The production of motion picture plays on health topics was continued during the year. The following films were completed:—

(1) "Why die of Cholera?"
(2) "A pilgrimage to Hardwar *Kumbh* Fair, 1927."
(3) "The Tragedy of Smallpox."

The first was ready in March, 1927, and was first shown at the Public Health Exhibition held in Lucknow in March and then sent to Hardwar, where performances were given during the *Kumbh Mela* for about one month. Film No. 2 was first shown at Calcutta on the occasion of the 7th Congress of the Far Eastern Association of Tropical Medicine and No. 3 at Lucknow when the delegates to the Congress visited the place on their northern tour.

The charge of the malaria branch was held by Captain D. Clyde, I.M.S., throughout the year. Dr. B. M. Roy acted as senior assistant and Dr. P. N. Chatterji as junior assistant.

Malarial surveys were made of the following places during the year:—

(*i*) Banbassa.
(*ii*) Kashipur and Bazpur tahsils, Naini Tal district.
(*iii*) Certain villages in the Moradabad district.
(*iv*) Daryabad, Bara Banki district.
(*v*) Khurja town.
(*vi*) Bhimtal.

Laboratory work.—(*a*) In connection with various surveys 2,260 blood films were examined, 311 of which or approximately 13.76 per cent. showed malarial parasites.

(*b*) 26,991 anopheline mosquitoes were received and classified in connection with a scheme for mapping out the provincial distribution of the various anophelines.

(*c*) Over 300 "carrier" anopheline mosquitoes were dissected for oöcysts and sporozoites.

Malaria training class.—A class of ten officers of the Public Health Department—four D.P.H's and six L.P.H's—was given one month's intensive training in malaria and anti-malarial measures.

Colonel Dunn again comments on the defective reporting of cholera outbreaks in the province. The procedure adopted of supplying two service postcards to each *patwari* for prompt reporting of cholera cases proved useful and it is recommended that the scheme be now sanctioned as a permanent measure.

ANNUAL REPORT ON THE WORKING OF THE CIVIL HOSPITALS AND DISPENSARIES IN THE MADRAS PRESIDENCY FOR THE YEAR, 1927. BY MAJOR-GENERAL F. H. G. HUTCHINSON, C.I.E., K.H.S., I.M.S. PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS, MADRAS, 1928. PRICE, Rs. 2-12.

THE Annual Report on the working of the civil hospitals and dispensaries in the Madras Presidency has only recently come to hand. The following are some of the more interesting features contained therein.

Number of hospitals and dispensaries.—At the beginning of the year under report there were 959 medical institutions of all classes in the Presidency. One hundred new dispensaries were opened during the year and 21 were closed. Thus at the end of the year there were 1,038 medical institutions in the Presidency, i.e., 69 Government institutions, 27 State Special, 791 Municipal, Local Fund and Rural, 31 Private aided, 68 Private non-aided, and 52 Railway dispensaries.

In-patients.—Patients treated in in-door departments of medical institutions of classes I, III, IV of the Presidency during the year numbered 170,966 against 159,043 in the previous year. The number of in-patients shows an increase of 7.49 per cent. over the number treated in 1926. This rise is due to the opening of several new dispensaries in the Presidency and also to the increasing popularity of the hospitals.

Deaths.—There were 8,500 deaths during the year as compared with 8,052 in the previous year. The death-rate was 4.97 against 5.06 in 1926.

Daily average attendance.—Consequent on the increase in the number of in-door patients, the daily average attendance which was 7,078 in 1926 rose to 8,025 in 1927.

Beds.—There were 4,632 beds for males and 3,717 for females during the year under report, as compared with 4,478 for males and 3,616 for females during 1926.

Out-door patients.—10,452,460 patients sought out-door relief at the various hospitals and dispensaries of classes I, III, IV and VII as compared with 10,059,359 for the previous year. The total number of both in-door and out-door patients treated was 10,623,920 against 10,218,402 in 1926.

The chief diseases treated among the in-patients were malaria, diseases of digestive, generative and respiratory systems. Among the out-patients the diseases most prevalent were those of the digestive system, injuries (general and local), malaria, syphilis (primary and secondary), dysentery, and all diseases of the respiratory systems.

Communicable diseases accounted for 1,377,884 patients with 3,784 deaths in 1927 against 1,371,496 with 3,671 deaths in 1926. The diseases treated in their order of prevalence were malaria, dysentery, syphilis (primary and secondary) and influenza.

Leprosy.—13,368 persons were treated for leprosy during the year. Government are gradually increasing the facilities for treatment aided by the grants from the provincial branch of the British Empire Leprosy Relief Association. The need for extension is also revealed by the fact that 47 pupils attending secondary schools were found by medical inspectors suffering from leprosy.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Gonorrhœa and syphilis.—64,974 cases of gonorrhœa and 85,101 cases of syphilis were treated. In every district these diseases are widely prevalent. The efficient treatment of 85,101 cases of syphilis would cost in drugs alone about 17 lakhs of rupees.

The recommendations of the British Social Hygiene Council's Delegation are under the consideration of Government.

Beriberi.—10,824 cases of beriberi were treated and though every district reported cases, the vast majority came from Guntūr, Kistna, East and West Godāvari and Vizagapatam. The application of Lt.-Col. R. MacCarrison's studies in nutrition would bear great fruit in these districts.

26,287 cases of pulmonary tuberculosis and 11,215 patients with other forms of tuberculosis were treated.

834,794 patients suffering from malaria attended hospitals. If 100 grains of quinine had been given to each, no less than 11,928 lb. of quinine would have been consumed at a cost of some two lakhs of rupees.

Smallpox.—The total number of patients treated for smallpox during the year was 547 with 25 deaths.

Anti-hookworm campaign.—Anti-hookworm campaign continued to be carried on with the assistance and co-operation of the Rockefeller Foundation of America.

Government and Local Fund hospitals assisted in the campaign and 76,047 cases received treatment during the year.

Of the patient treated in all classes, Hindus were as usual the largest number. Next in order of numerical strength came Muhammadans, others, Europeans and Anglo-Indians. There has been an increase under all classes of patients treated during the year.

The total number of operations performed in all classes of institutions was 428,749 on 422,066 patients. Of these operations, 422,066 were principal and 6,683 secondary. The corresponding figures for 1926 were 453,346 on 441,846 patients. The ratio of deaths per cent. to total operated on works out to 0.27 against 0.26 in 1926. The number of operations returned as "major" during 1927 was 33,363 with 865 deaths and a calculated death-rate of 2.59 per cent. against 29,419 with 842 deaths and a calculated death-rate of 2.86 during 1926.

Labour cases.—In 1927, 50,033 normal and 6,557 abnormal cases were conducted by the staff of the medical institutions as compared with 54,349 normal and 7,501 abnormal cases during 1926. The percentage of death to total delivered was 0.45 during the year.

Private, aided and non-aided institutions.—The total number of in-patients treated in this class of institutions was 21,036 with 702 deaths. There were 763 beds for males and 546 beds for females. The number of admissions for principal diseases was 12,921, 9,531 were cured, 380 died, and 1,767 were discharged otherwise.

Out-door patients.—545,940 patients sought out-door relief at these institutions.

Labour cases.—Two thousand six hundred and twelve labour cases were conducted by the staff of these institutions. The percentage of death to total delivered was 1.7.

Dieting.—The new scales of diet sanctioned for Government hospitals in the Madras City were also introduced into the mofussil Government hospitals.

Medical relief in rural areas.—The year has been characterized by the opening of more rural dispensaries and of transferring certain rural dispensaries to better centres where they would be of more utility to the rural population. The total number of rural dispensaries sanctioned up to the end of 1927 was 337, out of which 306 have been opened. Besides this, 11 rural dispensaries were maintained by the Taluk Boards at their entire cost.

General.—Arrangements were made during the year for the Dental Surgeon of the Government Rayapuram Hospital to afford dental treatment to in-patients at the Government General Hospital, Madras, on certain specified days in the week.

REPORT ON THE WORKING OF THE RANCHI INDIAN MENTAL HOSPITAL, KANKE, IN BIHAR AND ORISSA FOR THE YEAR, 1927, BY CAPTAIN J. E. DHUNJIBHOY, I.M.S., SUPERINTENDENT, INDIAN MENTAL HOSPITAL, RANCHI. PATNA: SUPERINTENDENT, GOVERNMENT PRINTING, BIHAR AND ORISSA, 1928. PRICE, Re. 1-4.

Accommodation.—The total accommodation of this hospital is as follows:—

Male	1,014
Female	272
Total ..	1,286

Of this, three-fourths are for Bengal and one-fourth is for Bihar and Orissa.

Throughout the period under report, the hospital remained over-congested. The question of providing additional accommodation to relieve congestion is receiving the serious attention of Government.

Patients.—The maximum number resident in the hospital on any one night during the year under report was 1,196 males and 242 females, total 1,438; against 1,172 males and 219 females, total 1,391, in the previous year.

The number of patients resident in the hospital at the beginning of the year under report was 1,170 males and 219 females, or a total of 1,389 of both sexes.

Total admissions.—The total admissions registered during the year were 228 males and 54 females, total 282; against 177 males and 45 females, total 222, (excluding 46 males and 37 females, total 83, who were received on transfer from the Dacca Mental Hospital) in the previous year.

Total re-admissions.—The total re-admissions during the year under report were 11 males and one female, total 12; as compared with 10 (7 males and 3 females) in the previous year. Out of the total re-admissions (12), 9 males were re-admitted after trial as sane under section 471 of the Criminal Procedure Code. Actual re-admissions due to relapses were only two non-criminal males and one non-criminal female.

Cases under observation.—There were 16 cases (15 males and 1 female) under brief periods of observation in this hospital during the year under report, as compared with 5 patients in the previous year, of whom 12 (11 males and 1 female) were ultimately certified and admitted to the hospital. Out of the remaining 4, 3 were released as not certifiable and 1, although certified to be insane, was released by the committing magistrate as he was not dangerous to himself or others and as there is no accommodation in this hospital at present for such harmless cases.

Total population.—1,671 patients (1,398 males and 273 females) were treated in the hospital during the year under report compared with 1,564 (1,323 males and 241 females) in the previous year.

Daily average strength of the hospital was 1,409.53 (1,181.54 males and 227.99 females) as compared with 1,350.66 (1,146.87 males and 203.79 females) in the previous year.

Ratio per cent. of cures to the daily average strength was 15.74 males and 14.04 females, total 15.54; against 8.54 males and 7.36 females, total 8.36 in the previous year.

Ratio per cent. of cures to the total admissions during the year under report was 30.87 males and 13.20 females, total 27.41; compared with 7.41 males and 5.06 females, total 6.78 in the previous year.

Percentage of deaths to daily average strength.—There were 44 deaths (39 males and 5 females) against 52 in the previous year. The percentage of deaths to daily average strength was 3.30 males and 2.20 females, total 3.12; as compared with 4.01 males and 2.89 females, total 3.85 in the previous year; and the percentage of deaths to total admissions was 4.14 males and 1.89 females, total 3.70 in the year under report against 2.31 males and 2.53 females, total 2.37 in the preceding year.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BISOXYL

A sterile preparation
containing Bismuth Oxychloride in an extremely fine state of sub-division
for use in the treatment of acute conditions

Bisoxyl contains, in an extremely fine state of sub-division, a high percentage of Bismuth; this is absorbed rapidly by the tissues, the result being an immediate destruction of the spirochætes. Indeed, the power of Bisoxyl in healing syphilitic lesions is remarkable, and its use replaces that of mercury, to which it is said to be superior in activity and safer in use.

The injection of Bisoxyl causes no local complications, and it induces no pain either during or after its injection.

Bisoxyl may be used in conjunction with salvarsan or neosalvarsan, or it may be used as a substitute for either.

Descriptive literature will be sent on request to either of the B.D.H. resident representatives:—

HENRY S. CLARK,
8-10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Buildings,
Parsee Bazar Street,
Fort, BOMBAY.

THE BRITISH DRUG HOUSES LTD.
LONDON

Bis/In/297

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Phanodorm

(Cyclohexenyl-ethylbarbituric Acid)

The latest hypnotic
for the routine treatment of

INSOMNIA

of various origin
anxiety, emotional excitement, worry.

An excellent sedative in mental unrest, neuroses, psychoses.

Distinguished by its *safety, efficacy* and *non-habit-forming* properties.

Its sleep-producing effect compares favourably with that of any other hypnotic whilst its toxicity is inappreciable.

Readily taken, it quickly induces a natural-like sleep, from which the patient awakes feeling rested and refreshed.

E. MERCK
DARMSTADT

Packing
Tablets 0.2 gm. tubes of 10
and in powder.

Samples and literature upon request to
Martin & Harris, Ltd.,
Rowlette Building, 17, Prinsep Street, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Daily average sick.—The daily average number of patients treated for bodily ailments was 57.59 males and 7.86 females, total 65.45.

General health of the patients has been good and there was no outbreak of any kind of epidemic disease.

Post-mortems.—During the year under report 40 post-mortems were performed and interesting specimens of brains and other parts were preserved for demonstration purposes.

Accidents and injuries.—Some minor injuries and accidents took place during the year under report but none were serious or worth mentioning.

Escapes.—There was only one case of escape during the year under report against 5 in the previous year. The incident took place while the patient was working outside the hospital in the vegetable garden. He was subsequently recaptured.

Suicide.—There was no case of suicide in the year under report. There were two cases of suicide by hanging in the previous year.

Criminal Insanes.—The daily average strength of criminal patients was 561.16 males and 44.66 females, total 605.82 during the year under report, against 549.04 males and 42.77 females, total 591.81 in the preceding year.

The treatment of the mental condition.—As already reported in the previous year's Annual Report, the treatment received by the patients in this hospital is up to the level of the latest methods employed in all modern mental hospitals.

Hydrotherapy.—Which is one of the most important lines of treatment, could not be carried on extensively as no quiet or secluded place, which is necessary for this kind of treatment, was available owing to overcongestion of the hospital. Nine cases, however, underwent this treatment. The maximum number of hours of treatment a single patient received was 528 and the minimum was 36.

Vigorous efforts were made throughout the year under report to carry out occupational therapy in its various branches and much improvement and success were achieved in this direction. Except old, infirm, and acute cases, all patients are employed in one or other kind of occupation for which enough facilities exist in this hospital.

Recreation.—Patients immensely enjoy the outdoor and indoor games which exist in this hospital. Those who are not able to play enjoy watching the games.

During the year under report the Kanke Dramatic Club entertained patients with two theatrical performances in which some of the patients also acted.

Throughout the year under report musicians were employed to entertain the patients four times a week in the male section and twice a week in the female section.

Feasts were given to all the patients during the Pujah and Holi festivals. Special feasts were given to Hindu, Muhammadan and Christian patients during their respective festivals. Patients' religious feelings and sentiments are respected as far as practicable, and many are encouraged to observe fasts on religious grounds if they so desire and a special diet is arranged for them.

Diet.—The diet of this hospital is worked out with the greatest care as it affects the well-being and happiness of so many people; it is chiefly based on vitamines and caloric values. During the year under report a further scientific survey of the diet was made and it was found that the diet was a little deficient in its fat constituents. To meet this deficiency half a chatak of good ghee per head per diem was immediately sanctioned.

Patients' clothing and bedding.—During the year under report scales of clothing and bedding befitting a modern mental hospital were drawn up and submitted to Government for sanction. It is hoped that the scale may be sanctioned as early as possible.

The destruction of clothing and bedding is becoming markedly less every year, which proves beyond doubt that the patients are becoming more content, better cared for, and less irritable. The destruction is less in spite of the fact that strong, ugly looking, coarse jail clothing was entirely replaced by lighter and more comfortable materials. This observation lends further support to the argument that the more patients' attire approaches to that of the normal, the more contented they will be, and incidentally less destruction and more economy will result.

Parole.—Dependable and non-dependable patients are allowed to go out daily for their morning and evening walks, the former without and the latter with attendants. The hospital char-a-banc is as usual in great demand by patients for motor drives and shopping at Ranchi.

Cinema.—The claim for a machine as one of the most valuable forms of psychotherapy is undisputed, so much so that a mental hospital without a cinema machine is never considered "modern."

Sanitation.—There was no epidemic disease of any kind either in the hospital or in the staff line, except one case of smallpox in the staff line, the victim being one of the attendants; he was immediately removed to the Ranchi Sadar Hospital and all his contacts were thoroughly disinfected and segregated. Stringent sanitary measures such as vaccination of all patients and staff, etc., were taken.

Nursing staff.—Male nurses for the male section and additional female nurses for the female section have not been appointed yet, and hence there is still a complete lack of nursing in the male section and inadequate nursing in the female section. The sooner this vital question is settled the better.

Attendant staff.—A slight degree of improvement in the standard of work of the attendant staff was noticed during the year under report. Still, much remains to be desired in their work. The attendant staff in charge of the suicidal wards deserve great credit, for it was entirely due to their vigilance that no patient throughout the year under report committed suicide though numerous desperate attempts were made by many potential suicides.

Manufacturing Departments.—The manufacturing departments of this hospital were in full swing throughout the year under report, and goods valued at Rs. 23,000 were manufactured and made over for the use of the hospital by these departments. It must be distinctly understood that the manufacturing departments of this hospital are run purely on a therapeutic basis and not on a commercial basis as in jails, hence a large profit cannot be expected from these departments. The profit made by the manufacturing departments during the year under review was Rs. 13,000, less cost of raw materials.

Captain J. E. Dhunjibhoy, I.M.S., held charge of the hospital throughout the year except during the period 17th to 31st December, 1927, when his duties were performed by Dr. J. Roy.

Correspondence.

HERPES ZOSTER AND VARICELLA.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—The following case may be of interest, as it points to the close association of herpes zoster and varicella:—

A constable of the local police barracks was attacked with typical herpes zoster on 7th March, 1929. Another constable living in the same room in the same barrack and sleeping in the next cot at a distance of only about 3 feet away from the first was attacked with varicella on 30th March, 1929. The herpes zoster patient lived in the same room until the 15th March, 1929, when he was admitted to hospital for treatment.

There have been no cases of varicella in this locality since January, 1928; the locality is a very isolated one, and the second patient had not left the locality since the last week in January, 1929; so that the infection could not have been brought in from outside. The only possible source of infection appears to have been the case

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of herpes-zoster who shared the same room as the second patient up to the 15th March, 1929.—Yours, etc.,

BIJOY KRISHNA CHATTERJEE, M.B. (Cal.), D.T.M. (Bengal).
Assistant Surgeon.

ASSAM BENGAL RAILWAY HOSPITAL,
LUMDING, ASSAM,
21st April, 1929.

INTRAVENOUS PITUITRIN.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With regard to the correspondence from Dr. R. K. Bhattacharjee in your issue for last April regarding the intravenous use of pituitrin, my own experience of this method has been as follows:—

In several cases of malaria when the patients were in an almost moribund condition, I used intravenous injections of quinine bihydrochloride grs. 10 in 10 c.c. of normal saline with 10 minims of adrenalin chloride solution added. The injections were given very slowly at the rate of 1 c.c. per minute.

In several other cases associated with collapse I used pituitrin 1 c.c. in 5 c.c. of normal saline, given slowly at the rate of about 2 c.c. per minute, without having ever noticed any of the untoward symptoms referred to in the correspondence. My practice has been to prepare the normal saline with doubly distilled water, and to stock it in 5 c.c. and 10 c.c. ampoules for ready use in emergency cases. I seal the ampoules on a spirit lamp with a blowpipe. With a little practice this can easily be done in the mofussil.—Yours, etc.,

S. N. GUHA, L.C.P.S.

BINODEPUR, JESSORE,
19th April, 1929.

INTRAVENOUS IODINE.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Nature's great gift of iodine is proving so widely useful in the world of therapeutics that it would be helpful if some skilled pharmacologist would undertake a study of its mechanism of action and publish his results. From what has appeared from time to time within the columns of the *Indian Medical Gazette* within the past decade, intravenous iodine seems to be growing more and more popular in the medical world.

The first very valuable article was contributed by Major Porter in 1921, in which he mentioned that it was a proved fact that iodine and iodides produce increased leucocytosis, and that intravenous iodine produces an extremely rapid hyper-leucocytosis, the count rising to almost three times the normal, and remaining raised for some days. Hence perhaps it should be given with great caution and in small doses to anæmic and asthenic patients, and perhaps to none more frequently than once a week. The author recommends a dose of up to 4 grains intravenously, and also mentions a few cases of influenzal broncho-pneumonia treated with iodine given intravenously in saline solution. Normal saline is undoubtedly a better diluent than simple water inasmuch as it counteracts the irritation caused by nascent iodine. With this diluent I gave several injections into my left dorsal radial vein before it became obliterated (subsequently causing much trouble by the extensor tendon slipping away except on very limited movements of the thumb). On the other hand I have seen much harm done to the veins of the arm and ankle by single injections of solutions in distilled water.

The second important paper was that by Colonel Jeudwine in 1923, who described a large number of cases treated, thus adding a good deal to our knowledge of this new remedy. He recommends doses of ½ to 2 grains, diluted to 10 c.c. The greater the dilution, the less injurious and less painful the effect upon the vein; and the thinner the vein, the greater the local trouble caused by the irritant action of the iodine. The saline wash though recommended by this author may perhaps be replaced by dissolving the iodine in saline.

As regards reaction, it is usually mild. In febrile cases, such as pneumonia, it raises the temperature by a degree or two. In my own case, after my blood (or system) had become rather saturated by a number of infections, an injection of gr. 1 in 5 c.c. of distilled water was followed by disagreeable iodism (pains in the joints and muscles, lasting a few hours). With a subsequent injection of gr. ½ in 5 c.c. only very mild iodism appeared in the nose and throat. (This in fact is the place where iodism, if it ensues, is first felt within half an hour of the injection. Next the effect is seen in the urine which appears to contain more solids, to have a high colour, and to produce irritation on micturition.) Weakness was felt after every injection for some three days, especially after the later injections. Reaction seems to depend upon idiosyncrasy.

In 1925 it was recommended that adrenalin chloride solution, 10 minims per dose, should be added to the injection. This seems to be a good corrective, whether the action of the iodine be a direct one or an indirect one through the thyroid. In tuberculous cases the use of this remedy, alternating with injections of 3 per cent. sodium morrhuate solution, seems reasonable in cases with a temperature not exceeding 100°F. Sodium morrhuate seems to act best in afebrile or only slightly febrile cases, and not to be suitable for acutely febrile ones.

In a past number of the *Antiseptic* the hypodermic use of 5 per cent. "glyceroiodine" is recommended, the author stating that this is as good as intravenous iodine. I have tried these injections on myself, and found: (*i*) that the solution was too thick to pass through the needle except when it was quite warm; (*ii*) that the burning which it causes is indescribable. I therefore diluted it with saline, but the smarting produced was still quite enough to make any patient who is not paralysed dance with pain. I then diluted the preparation first with an equal part of glycerine, and then with an equal part of normal saline at the time of injection. This injection is tolerable, the pain only lasting for a couple of minutes, and being limited to the site of injection. I have used this solution in cases for several weeks, viz., a 2½ per cent. solution of iodine in glycerine, freshly diluted with an equal part of normal saline just before injection, in doses of from 0.5 to 2 c.c., i.e., gr. ¼ to gr. 1 of iodine. Beneficial it is undoubtedly, but more than gr. 1 of iodine cannot be administered readily or conveniently by this method. The 2½ per cent. solution of iodine in glycerine also differs in colour from the "5 per cent. glyceroiodine"; it is darker in colour than the latter.—Yours, etc.,

M. ASLAM OMAR, L.M.P. (Agra).

GONDA, UNITED PROVINCES,
15th April, 1929.

MEDICAL SCIENCE IN INDIA.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Colonel Gill's lecture delivered before the Punjab branch of the British Medical Association (reported as a "special article" in the *Indian Medical Gazette* for March 1929) is interesting from several points of view. He has attempted a comparative description of the development of medicine in the East as well as the West, a subject of extreme interest to every student of medicine. His opinion of early Indian medicine, the medicine of Charak and Sushrut, is refreshing, being entirely free from the ordinary bias and prejudice of the average foreign writer and critic on the subject at the present day. He has rightly stated that the medicine of India at the time of Charak and Sushrut was permeated with "the scientific spirit" as shown by "a desire, by observation and experiment, by induction as well as by deduction to prove the secrets of Nature and to *build thereon a rational* system of medicine." No doubt it is "worthwhile to take stock of the situation, to trace the history of medical science in India and, having then clarified our ideas in regard to the past, to consider briefly the present and the future."

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOVRIL Limited cordially invite any medical man visiting England to inspect their factory at any time.
148-166, Old Street, London, E.C.1.

The Value of BOVRIL in illness

Beef has well authenticated special powers of stimulating cellular activity, of restoring the tissues of the body and of toning up the whole system.

Bovril contains these powers in a highly concentra'ed, effective and digestible form. That is why Bovril has been recommended for years by the medical profession to meet the extra demands of enfeebled systems during convalescence.

BOVRIL

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A WORTHY PRODUCT

FOR INDIA.

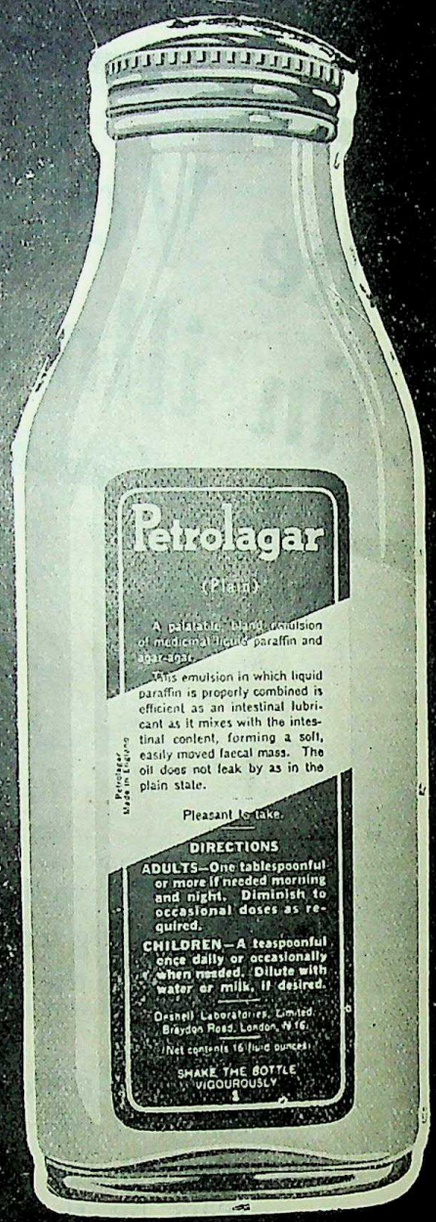
Doctors can easily prove now to their entire satisfaction the many advantages of Petrolagar over salines or cathartics for the treatment of constipation.

A simple test will prove its merit—prescribe one or two tablespoonfuls night and morning for five of your patients—the results will prove most gratifying.

Write for interesting literature to Messrs. H. J. Foster & Co., Ltd., P. O. Box 202, Bombay, our Distributing Agents for India, Burma and the Malay States.

"Petrolagar" is manufactured only by Deshell Laboratories, Ltd.

Braydon Road, London, N. 16.



Petrolagar Alkaline is specially valued in the Tropics as by its bland and mildly alkaline action it allays inflammation and has a soothing effect on the bowel. The oil present is not absorbed, therefore it is not heat producing. Petrolagar is manufactured by a special mechanical process which requires no handling.

Petrolagar

'Petrolagar' is the trade mark distinguishing the fine emulsion of mineral oil and agar-agar, issued in four varieties: Plain, with Phenolphthalein, Alkaline and Unsweetened, manufactured only by Deshell Laboratories, Ltd., London, N.16

CC-0. Gurukul Kangri Collection, Haridwar. Public Domain.

Digitized by Arya Samaj Foundation Chennai and eGangotri

But while tracing the history of medical science in India, certain mis-statements have crept in, in his otherwise interesting lecture and this is not unnatural, considering that there is no comprehensive authoritative history of the development of medicine in India, which has yet to be written.

Some of these mis-statements are as follows:—

(*i*) To what extent the Ayurvedic system was influenced by Greek thought and *vice versa* is not certain, but there is some reason to believe that each borrowed from the other. (*ii*) It is more than probable that the scientific spirit reached a higher stage of development in Greece than elsewhere. (*iii*) Demonology and the debased system of magic and spells overwhelmed and crushed the pure science that flowed from the spring of Sushrut at a very early period of Indian Medicine.

(i) The influence of Greek thought on Indian Medicine.

The priority of Indian over Hellenic civilization has been admitted by several distinguished European scholars writing on the subject; e.g., Schulze in his *Historia Medicinæ*, Royle in his *Antiquity of Hindu Medicine*, Wise in his *Commentary on the Hindu System of Medicine*, Professor Wilson in the *Oriental Magazine*, A. Soma de Koros in the *Journal of the Asiatic Society of Bengal Transactions*, Heins in his *Tracts of India*, Hoernle in the *Bower Manuscript*, Max Muller in his work on *Hindu Wisdom*, Macdonell in his *History of Sanskrit Literature* and other reputed orientalists.

We hear of Greek philosophers visiting the East: e.g., Paracelsus who owed his inspiration to India (Schroeder in his work *Pythagoras ünd die Inder*—quoted in Sir P. C. Roy's *Hindu Chemistry*) and actually visited India (Elliott's *Greek and Roman Medicine*); Hippocrates who owed his medical knowledge directly or indirectly to India (Castellani and Chalmer's *Tropical Medicine*). India was visited by Pythagoras, Anaxarchus, Pyrrho and others who afterwards became eminent philosophers in Greece (*Brucker's Philosophy by Infield*). From Pliny we learn that Pythagoras, Empedocles, Democritus, Plato, Thales, Crates and Endoxus and others are stated to have travelled in the East (quoted by Royle).

On the other hand "we never hear of Hindus travelling for knowledge beyond the precincts of their own country." Sir William Jones has affirmed it "as improbable that the Brahmins should have borrowed from other nations, specially the Greeks, whom they despised as "yavanas"—while in astronomy the Hindus borrowed from the Greeks which they distinctly mentioned. As far as medicine is concerned we find nothing mentioned anywhere about their borrowing from the Greek Scholars (*yavana acharyas*).

"The period of Ctesias and Hippocrates is at least a century prior to the time when there seems to have been considerable mental activity with cultivation of literature, amongst all the nations of the East. Then Buddhism rose in India, Pharoah Nechao reigned in Egypt, Zoraster flourished in Persia, Confucius in China"—Charak and Sushrut as we shall show later on flourished long before the Buddhistic period of Indian history.

Egyptian civilization is considered as much earlier than Hellenic. Royle has taken great pains to prove that Egyptian and Hindu civilization were contemporaries. Sir William Jones had stated that in the *Purans* (which came after the *Vedas*) we shall in time discover all the learning of the Egyptians. Sir P. C. Roy in his *Hindu Chemistry* has shown the close analogy between the *Atharva-veda* and the *Papyrus of Leyden*. Both deal mainly with "charms, spells, magical incantations and amulets," Hindu civilization was therefore much earlier than the civilization of the ancient Greeks.

We may therefore conclude that Hindu civilization was much earlier than the Hellenic and was probably contemporary with Egyptian civilization. Egypt was called the *Misra-desh* by the ancient Hindus. The priority of Hindu civilization, the "superiority complex" idea of the Brahmans (the educated section of the ancient Hindus), who used to hate every foreigner as *yavana*, the absence of any authentic record of Hindus going outside India to learn the wisdom of foreign lands, the fact that early Greek Scholars visited the East, including India, and lastly that Hippocrates flourished much later than Charak and Sushrut—all these facts conclusively prove that *Ayurved was not at all influenced by ancient Greek thought.*

There is apparently some resemblance between the two systems of medicine. Both are based on their "physical philosophy" and their "humoral theories." On making a comparative study we find that "the analogy is more superficial than real" as the following will show:—

Physical philosophy of the Greeks.

The original of all things is the *monad*. From the *monad* sprung the *duad*. From the infinite *duad* arose the world. Everything in the world is composed of *four elements*, viz., earth, water, fire and air (Pythagoras).

Physical philosophy of the Hindus.

The origin of all things is *purush*. From *purush* arose *Prakriti*. From *Prakriti* arose the world.

Everything in the world is composed of *five elements*, viz., earth, water, fire, air and ether.

Aristotle was the only Greek philosopher who conceived of the existence of five "elements" like the Hindus. He must have borrowed the idea directly or indirectly from the ancient Hindus. In Greek medicine however only the four "elements" are recognised.

Humoral theory of the Greeks.

There are four humours, viz., black bile, yellow bile, blood and phlegm. There are three airs or vapours, viz., in the chest, in the head, and in the abdomen.

Humoral theory of the Hindus.

There are two humours, viz., *pittya* and *kappya*. There are five airs or vapours, viz., in the head, in the neck, in the chest, in the upper abdomen, and in the pelvis.

This is of course no place to discuss whether the so-called humours are really humours or hormones, as Dr. Brock in his book, *Galen on Natural Faculties*, considers them in the case of Greek medicine, or as Indian Scholars consider them in the case of Hindu medicine. Further, the so-called "airs" or "vapours" in both the systems are nerves and their forces or otherwise (*vide* the writer's article on the subject in the *Indian Medical Gazette*, February 1923).

The writer is strongly of opinion from the internal evidence mentioned above that in the very early days *Greek medicine was not much influenced by Hindu thought* as well. It is very likely that the ancestors of the entire human race, when they migrated from Central Asia carried the germs of medical truths like humours, airs, etc., with them in their migrations. So far as India is concerned the fact is corroborated in finding the rudiments of the humoral theory in the *Rig-Veda*. Later on each nation developed its physical philosophy and humoral theory according to its racial genius.

Considering from internal evidence that the analogy between the two systems is more superficial than real and does not seem to bear a close examination, we cannot but fall back on the "*theory of common origin and independent parallelism of growth*" of those systems of the Greeks and the Hindus and that there was no borrowing by either. The same conclusion has been independently arrived at by a great European orientalist—Goblet d' Alviella in his *Classical influence in literary and scientific culture in India, Bulletin de L' Academic Royale de Belgique* (quoted in Sir P. C. Roy's *Hindu Chemistry*).

(ii) The Scientific Spirit reached a higher stage of development in Greece than elsewhere.

In this connection Colonel Gill made a slight mistake in confounding Charak the physician with Sushrut the surgeon.

To discuss this point we must state in brief the development of Ayurved, during successive periods:—

(*a*) *The Vedic period* (4000—2500 B.C.).

This is the "primitive" and "mystic" period of development of Hindu medicine. The art of medicine

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

consisted of the use of a few simple herbals. *Rig-Veda* (primitive period) deals mainly with charms, spells; magical incantations, amulets, etc., in a later veda—*Atharva-Veda* (mystic period).

(*b*) *The Ayurvedic period* (2500—600 B.C.).

This consists of two periods, the "philosophic" period of Charak and the "anatomic" period of Sushrut.

During this period great wars were fought as described in the two great epics of *Ramayan* and *Mahabharat*, when surgery reached its acme in India.

According to Dr. Muthu (*Brief Survey of the Antiquity of Hindu Medicine*) in this period which he calls the "epic period," there were "distinguished surgeons on the staff of the contending armies. The army surgeons were fully equipped with every necessary medical and surgical appliances, regularly accompanied the army in the field and undertook both minor and major operations."

Another outstanding figure later on in this period was Vagbhatta who epitomised the medical knowledge up to his time in his *Astangahridays* (making copious extracts from Charak the physician and Sushrut the surgeon), as Hippocrates had done from Egyptian and ancient Greek medicine. His masterly treatise became so very popular in Southern India, "that the very names of Charak and Sushrut were forgotten in many parts of the Deccan" (Sir P. C. Roy's *Hindu Chemistry*).

In comparing Hippocrates and Vaghbatta it must be noted that while in the treatise of the latter there is little original, the writings of the former are full of original ideas, for with him ancient Greek medicine entered the "philosophic stage and thus he was aptly called the 'Father of medicine in the West.'"

(*c*) *Buddhistic period* (600 B.C.—600 A.D.).

This period is gradually marked by the restriction of dissection and the decline of anatomy, as a result of the tenet of *ahimsa* (non-injury to man and animals) of Buddhism. "As a result both surgery and midwifery declined; the former was left in the hand of the village barbers and the latter in the hand of the village *dhais*."

But this period "marked the revival of medicine and chemistry, which were taught in the world-famous universities of Nalanda, Taxilla, etc. During the reigns of Chandragupta and Asoka, hospitals for men and animals were more extensively provided."

During this period chemistry, which developed in India "as a handmaid of medicine," was increasingly studied, and mineral and metallic drugs were increasingly used.

During this period the central figures were the famous physicians and alchemists Patanjali, Nagarjuna, Nandy and others.

It is ridiculous to believe that during this period "when there seems to have considerable mental activity with cultivation of literature amongst all nations of the East," marks according to Colonel Gill the decline of the "scientific spirit" of research and enquiry in the domain of Indian medicine. For this is the period of Buddha in India, Zoraster in Persia, and Confuscius in China.

During this period, a century after Buddha, Hippocrates flourished in Greece. His knowledge of medicine bears close analogy with that of Indian medicine at the time handed down since the days of Charak.

We find that medicine is based on physical philosophy and theory in both countries.

The recipes were simple, consisting of a few simple herbs and occasionally an admixture of readily available minerals.

(In fact the knowledge of the use of metallic and mineral drugs did not advance as much in Greece as it did in India, for the Arabs who learnt medicine mainly from the Greeks did not advance beyond this stage in the use of minerals as did the ancient Hindus.)

Further we find a close analogy of the knowledge of some departments of medicine, e.g., personal hygiene (compare air, water, site, of Hippocrates) prognosis, examination of the patient, dietetics and so forth in both systems.

(*d*) *The Transitional period* (600—1100 A.D.).

The period marks "the parting of ways in the progress of Hindu medicine. Hitherto it consisted of simple recipes of vegetable drugs with a few readily available products of the mineral kingdom" handed down from Charak.

"With the advance of knowledge of medical chemistry, more metallic and mineral drugs were used and their claims could not be ignored."

Accordingly we find two schools of physicians, one belonging to the older school of Charak using mainly vegetable drugs, and those belonging to the new school using more mineral and metallic preparations.

Of the two outstanding figures in these periods one is Vrinda, whose work *Siddha-yoga* describes the bold use of preparations of minerals (metals and non-metals). He is probably the father of the *Siddha* branch of Ayurved of Southern India and Ceylon. It may be noted that in the South we find two classes of Ayurvedic physicians, *vaids* proper and those who follow the *Siddha* system.

The other is Chakradutta who in his book quoted from the pathology of Madhab the medicine of Charak and the *Siddha-yoga* (metallic and mineral preparations) of Vrinda. The work of Chakradutta became so famous that it became the textbook of medicine of Bengali Ayurvedists.

(*e*) *The Tantrik period* (1100—1300 A.D.).

Buddhism had been expelled from India and there was a revival of the Brahminical cult of a distinctly lower order.

The simpler religion of Nature—worship of the Vedas, the high metaphysics of the Upanishads were lost and India wanted to have a royal rood to *nirvana* (salvation). The cult of *Atharva-veda* was in the ascendent and medicine degenerated into "magic and spells." Dravidian civilization mixed with non-Aryan; superstition prevailed everywhere, specially in the East coast of the Peninsula, from Bengal to Madras, the home of the Tantrik cult. Demonology became triumphant for the time being. Alchemy was at its height and exaggerated claims were made about the efficacy of metallic and mineral drugs. A combination of mercury and gold was found to be the elixir of life. Religion degenerated into certain forms and conventions.

People began to believe that "man could intimately know the 'absolute' by a faculty called 'ecstasy' (partial suspension of animation). It was a combination of philosophy and religion and covered a good deal of mysticism, magic and spiritualism." The followers of the system became believers in some exercises, which later on developed into "*Hata-yoga*, Tantrik exercises" of the Hindus.

They entered as Kingsley wrote in another connection "the fairy land of ecstasy, clairvoyance insensibility to pain, mesmerism, *samadhi* (suspension of animation, complete and voluntary, of which we have authentic records)—"these modern puzzles used successfully by those bygone seekers of wisdom."

Even this dark age was not without its silver lining. The "scientific spirit" of research was not absolutely lost. During this period the study of the pulse began, though the ancient Hindus had had some idea of the "circulation" in the days of Charak and Mahabharat.

During this period the nervous system was intimately studied anatomically, physiologically, and metaphysically. The importance of the sympathetic system in relation to organic action and the brain as the seat of higher intellectual and metaphysical functions were recognised. Certain exercises (*hata-yoga*) were devised to control the involuntary sympathetics, by which the organs could be controlled at will and the state of *samadhi* attained. (For details *vide* the writer's article on the "Nervous System of the Ancient Hindus" read at the *All-India Medical Conference*, Calcutta, December 1928.)

During this period medical chemistry was advanced and its study continued.

(*f*) *The Iatro-chemical period* (after 1300 A.D.).

"During the Tantrik period, a vast mass of chemical information was accumulated, which was pressed into signal service during this period. The fantastic and exaggerated and extravagant ideas, impossible of realisation of the former period were recognised and had subsided into something more practical and tangible."

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

VITAMIN D in infant feeding

"When its mother's milk lacks Vitamins the infant suffers from marasmus–general feebleness"

Indian Medical Gazette, Feb., 1927

"..... The fact that Vitamin D deficiency appears to be largely responsible for marasmus in young infants and for rickets at a later period accords with some .... recent experiments."

From an article in a Leading Medical Journal, Jan. 1928

The richest milk in the world in Vitamins is New Zealand milk from which Glaxo is made

Glaxo

The Vitamin Milk-Food

Further information and literature gladly sent on request:
H. J. FOSTER & Co., Ltd., P.O. Box 202, BOMBAY

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TO REDUCE BLOOD PRESSURE

ANABOLIN

May be given orally or intramuscularly
Vial of 15 tablets; boxes of 6 ampoules
on prescription only
Through your usual Chemist

ANABOLIN (An-ab'-o-lin)

A residue extracted from the liver by fractional solvent methods which stimulates hepatic detoxication and reduces high blood pressure.

Literature and further information from the Endocrine Laboratory, Simla.

ENDOCRINES LIMITED.

WATFORD, HERTS, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"The numerous preparations of mineral drugs, though they could not secure immortality or revive the dead, were found to be helpful accessories in medicine." At first they came to be cautiously used and tentatively mixed with herbal recipes, but they soon began to assert their supremacy.

The two schools gradually blended into one, the present Ayurved where mineral and vegetable drugs are used in the same recipe. Gradually it was recognized that the simple vegetable drugs are useful in simple and acute forms of diseases. The more complicated sub-acute cases yielded more readily to a combination of both. In chronic cases where the *dhatus* or tissue systems and organs are not merely functionally affected, the *dhatus* or minerals (mark the same word *dhatu* means both tissue and mineral) gave better results.

Among the outstanding names of this period we find Sarangdhar, whose treatise shows a blending of both the schools of treatment.

(*g*) *The later Mahommedan period.*

This marks the real dark age of Ayurved, with the consolidation of the Mahommedan period with their own system of medicine. Ayurved was deprived of State-aid and State-recognition and gradually declined.

But though Ayurved was deprived of State-aid and recognition, it did not lose the patronage of the Hindu zemindars and Hindu princes, as well as of the mass of the Indian population. The torch of Ayurved was kept lighted by the *vaids* in *tolls*. The facility of independent systematic enquiry and research, the scientific spirit declined and we find only occasional research workers on Ayurveds during this period, like Bhava Misra of the United Provinces whose book became so famous as to become the textbook of Ayurvedists in Northern India. This is the best systematic treatise on Ayurved at the present day and is known as *Bhava-prokas*.

In Southern India where Mahommedan influence was least felt, the researches into chemistry continued and several books on mineral drugs known as *Rasa-granthas* were published from time to time by the *Siddha* school of Ayurvedists. Besides oxides and carbonates of minerals, tinctures were prepared (vide *Arka-prakas* from Ceylon).

Colonel Gill is therefore not correct when he says that the scientific spirit was more highly developed in Greece than elsewhere, meaning India of course; neither is he correct when he says that the "scientific spirit" which flowed from the fountain of Sushrut subsided soon afterwards and that Indian medicine was early dominated by demonology, sorcery, witchcraft, magic and so forth.

Conclusion.

A history of the development of Hindu medicine will have to be written by Indian scholars and impartial foreign orientalists. With the beginning of the present century, a wave has spread over the civilized West decrying the originality and antiquity of Indian medicine, which was unreservedly acknowledged by their predecessors up to the third-quarter of the last century. There are, however, a very few honourable exceptions.—Yours, etc.,

A. T. ROY, L.M.S.

HAZARIBAGH,
27th March, 1929.

THE TITLE OF "DOCTOR."

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I would be very much obliged if you will very kindly give me the benefit of your opinion in the following matter:—Would an assistant surgeon of the I.M.D. holding the qualification M.R.C.S. (Eng.), L.R.C.P. (Lond.), be considered wrong if he called himself Doctor in the commonly accepted meaning of the term, viz., medical practitioner, physician, etc.? By doing so he by no means infringes the by-laws of the Royal College of Physicians.

The prefix "Dr." I understand, is extended as a matter of ordinary courtesy to any medical practitioner, at least in this country, and, furthermore, I believe is even authorized by Government for Civil Sub-Assistant Surgeons.

Before I took out the above diplomas, I was always addressed as "doctor" and exception was never taken to this on my name-board.

What about the host of Indian practitioners who do not hold registrable English medical qualifications? Can they be commanded to remove the prefix "Dr." from their name-boards?

Finally, would a layman who had insulted a practitioner holding the said qualifications by telling him he was no more a doctor than the layman himself, come within the grip of the Law, in so far as the accepted meaning of the term goes, viz., medical practitioner or physician?

This I might remark is a question of immense interest for many men of the I.M.D. and an unbiased opinion from yourself would be very welcome.

During my residence in London I personally observed several medical practitioners holding only the qualification of the conjoint Medical Board, employ the prefix "Dr." on their name-plates and I am sure if this were irregular, the General Medical Council of Great Britain, who exercise constant watchfulness in these matters would have taken some action.

Thanking you very much, Sir,—Yours, etc.,

B. J. BOUCHÉ, M.R.C.S. (Eng.), L.R.C.P. (Lond.), I.M.D.

DINAPORE,
13th May, 1929.

(*Note.*—The point referred to by our correspondent is one which has been raised from time to time in our columns. Strictly speaking, the term "Doctor" should be reserved in medical practice for those persons with a registrable M.D. qualification. In connection with the publication of papers in medical journals it is better to limit the title to such persons, as here the readers addressed are professional men who are in a position to judge the professional status of the writer concerned.

In general practice in India, however, we believe that it is customary to use the title "Doctor" for all qualified medical men with a registrable degree—whether in the United Kingdom or in India. We see no harm in this general practice, since it serves to distinguish such men from unqualified quacks and the exponents of the indigenous systems. In England an F.R.C.S. would be horrified at being addressed by any other title than "Mr."; but in India we have known men with this specialist qualification deliberately to call themselves "Dr." in order to inform the layman that they belong to the medical profession.

The whole question is one of custom and usage. In medical publications we consider that the term "Dr." should be strictly reserved to those who have an M.D. qualification; but, in general usage and in lay papers and newspapers, we see no harm in differentiating a registrable man with a registrable medical qualification as "Dr."—EDITOR, *I. M. G.*)

EDUCATIONAL CINEMA FILMS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Several newspapers in India have published notices about the existence of the Scientific and Educational Film Society which has been registered in Calcutta under Act XXI of 1860 as an educational body having no lucrative object but having for aim to put at the disposal of all schools and colleges in India a series of 20 scientific and educational film shows per year.

In Bengal our attempt to introduce this powerful educational factor has proved successful by the fact that 50 schools have our educational film shows regularly.

We have therefore decided to extend our work over the whole of India and as we obviously can supply our films to only a limited number of schools it will be necessary to establish branches having their own films and outfit all over the country.

To enable us to bring this decision to the notice of the public, we would be very grateful if you would be so good as to afford us some space in your esteemed paper, and would render us your kind co-operation in our scheme.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The establishment of a branch of the Society will involve a small necessary capital for purchasing films, machines, and the necessary outfit, and as the Society has been registered under the above Act, we will require the assistance of public-spirited citizens interested in education to help our project to materialise.

I would therefore propose that a committee of influential people be formed locally who would have the interests of our work at heart. The necessary funds should be raised locally from voluntary donations or subscriptions.

Trusting in your co-operation,—Yours, etc.,

R. G. A. ALGOET,
Managing Director,
The Scientific and Education Film Society.

20, HARINGTON MANSIONS,
CALCUTTA,
27th April, 1929.

Service Notes.

APPOINTMENTS AND TRANSFERS.

COLONEL J. W. D. MEGAW, C.I.E., M.B., V.H.S., I.M.S., Officiating Surgeon-General with the Government of Madras, is appointed permanently to that post, with effect from the forenoon of the 3rd April, 1929.

Lieutenant-Colonel E. H. V. Hodge, M.D., M.R.C.P., I.M.S., Civil Surgeon, Chittagong, is appointed to act as Civil Surgeon, Darjeeling, *vice* Lieutenant-Colonel T. L. Bomford, transferred, with effect from the 19th April, 1929.

Lieutenant-Colonel T. L. Bomford, M.D., I.M.S., Civil Surgeon, Darjeeling, is appointed to act as Professor of Medicine, Medical College, Calcutta, and First Physician to the College Hospital, with effect from the 22nd April 1929, *vice* Lieutenant-Colonel J. D. Sandes, granted leave.

The Viceroy and Governor-General has been pleased to make the following appointment on His Excellency's Personal Staff, with effect from the 1st May, 1929:—

To be Honorary Surgeon.

Lieutenant-Colonel W. M. Houston, M.B., Indian Medical Service, *vice* Brevet-Colonel F. P. Mackie, O.B.E., M.D., F.R.C.S., F.R.C.P., K.H.S., Indian Medical Service, vacated.

Lieutenant-Colonel G. M. Millar, O.B.E., I.M.S., an Agency Surgeon, is posted as Civil Surgeon, Ajmer and Chief Medical Officer in Rajputana, with effect from the 29th April, 1929.

Lieutenant-Colonel H. M. Mackenzie, M.B., I.M.S., Officiating Inspector-General of Civil Hospitals, Punjab, is appointed permanently to that post, with effect from the forenoon of the 3rd April, 1929.

Lieutenant-Colonel L. Cook, C.I.E., M.B.E., F.R.C.S., I.M.S., Civil Surgeon, Patna, is appointed, with effect from the 20th May, 1929, to officiate as Inspector-General of Civil Hospitals, Bihar and Orissa, *vice* Colonel W. S. Willmore, M.D., M.R.C.P., I.M.S., granted leave preparatory to retirement.

Lieutenant-Colonel J. Husband, I.M.S., an Agency Surgeon, is posted as Residency Surgeon and Chief Medical Officer in Baluchistan, with effect from the 12th April, 1929.

The services of Lieutenant-Colonel H. Stott, O.B.E., M.D., I.M.S., are placed permanently at the disposal of the Government of the United Provinces, with effect from the 28th November, 1922.

Lieutenant-Colonel J. S. O'Neill, I.M.S., Civil Surgeon, from Meerut to Bareilly, *vice* Lieutenant-Colonel E. C. Hepper, I.M.S., granted leave.

Lieutenant-Colonel W. D. Wright, I.M.S., Civil Surgeon, from Gorakhpur to Allahabad, *vice* Lieutenant-Colonel H. R. Nutt, I.M.S., Civil Surgeon, granted leave.

Lieutenant-Colonel A. Cameron, O.B.E., I.M.S., Civil Surgeon, from Aligarh to Agra.

The services of Major H. H. Elliot, M.B.E., M.C., I.M.S., an Officiating Agency Surgeon, are placed at the disposal of the Government of India in the Department of Education, Health and Lands.

Major H. Caldwell Tait, M.B.E., I.M.S., Military Medical Officer, Roorkee, to be the Civil Medical Officer of Roorkee, in addition to his own duties, *vice* Major E. A. Penny, I.M.S., with effect from the afternoon of 23rd April, 1929.

The undermentioned temporary commissioned officers are appointed permanently to the Indian Medical Service subject to His Majesty's approval:—

Lieutenant Sher Mohammad Khan Mallick, M.B. Dated 16th February, 1928, with seniority from 18th August, 1927.

Lieutenant Euruch Ardeshir Ruttanji Ardeshir. Dated 30th April, 1928, with seniority from 16th December, 1927.

Lieutenant Thaku Chuharmal Ramchandani, M.B., F.R.C.S.E. Dated 30th April, 1928, with seniority from 12th May, 1926.

Lieutenant Cheruvari Kottieth Lakshmanan. Dated 30th April, 1928, with seniority from 21st October, 1925.

To be Lieutenants (on probation).

K. F. Alford, M.B., 4th February, 1929, with seniority 6th January, 1927.
H. J. Curran, M.B., 4th February, 1929.
H. T. McWilliams, M.B., 4th February, 1929.
P. Shannon, M.B., 4th February, 1929.
G. J. O'Connor, M.B., 4th February, 1929.
B. J. Griffiths, 4th February, 1929.
E. A. Y. Mackeown, 4th February, 1929.
H. S. Waters, M.B., 4th February, 1929.
W. P. Lappin, M.B., 4th February, 1929.
G. Milne, M.B., 4th February, 1929.
A. M. Fraser, 4th February, 1929.
D. L. Trant, 5th February, 1929.
W. Walsh, 22nd February, 1929.

LEAVE.

Lieutenant-Colonel J. D. Sandes, M.D., F.R.C.P.I., I.M.S., Professor of Medicine, Calcutta Medical College, and First Physician to the College Hospitals, is allowed leave on average pay for 6 months under Rule 81 (*b*) (*i*) of the Fundamental Rules, with effect from the 22nd April, 1929.

Lieutenant-Colonel F. E. Wilson, I.M.S., an Agency Surgeon, is granted leave on average pay for 5 months and 28 days, under the Fundamental Rules, with effect from the 12th April, 1929.

Major M. A. Rahman, I.M.S., Civil Surgeon on leave, was granted by the High Commissioner for India 3 days' extension of leave on half average pay in continuation of the 12 months combined leave sanctioned in Government Notification No. 1578|V—40, dated 8th December, 1927.

Captain G. H. Fraser, I.M.S., Officiating Superintendent, Mental Hospital, Agra, leave on average pay for 17 days combined with furlough for 5 months and 13 days, with effect from 4th April, 1929.

PROMOTIONS.

Lieutenant-Colonel to be Colonel.

C. W. F. Melville, M.B., F.R.C.S.E., I.M.S. Dated 4th February, 1929, *vice* Colonel W. O'S. Murphy, M.B., I.M.S., retired.

C. A. Sprawson, C.I.E., M.D., F.R.C.P., V.H.S., I.M.S., *vice* Colonel R. F. Baird, superannuated. Dated 16th March, 1929.

The promotion to his present rank of Major H. C. Tait, M.B.E., M.B., I.M.S., notified in Army Department Notification No. 235, dated the 25th February, 1928, is antedated from the 2nd February, 1928, to the 2nd August, 1927.

Major A. E. Grisewood, M.B., I.M.S., whose retirement was notified in the *London Gazette* of the 19th December, 1924, is granted the rank of Lieutenant-Colonel, 10th December, 1924.

Captains to be Majors.

R. S. Aspinall. Dated 19th April, 1929.
G. V. Ram Mohan, M.B. Dated 20th April, 1929.
L. K. Ledger. Dated 1st May, 1929.

Lieutenant to be Captain.

C. K. Lakshmanan. Dated 21st October, 1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Note for the Medical Profession

Selective Germicidal Power

IT is not generally recognized that antiseptics exhibit wide variations in their power of killing different bacteria. Any given antiseptic may kill one organism under certain conditions in high dilution; for another organism under similar conditions it will be found comparatively innocuous.

Phenol, the first antiseptic ever used, affords an example of this. It differentiates so markedly between the typhoid-coli group and the Gram-positive cocci that, if added in the proportion of 1 in 200 to a medium inoculated with a mixture of B. coli and streptococci, the former are killed and the latter multiply.

This poverty of action on the Gram-positive cocci—the common causes of sepsis—is characteristic not only of phenol, but of most of the powerful coal-tar antiseptics on the market, their active constituents being chemically allied to phenol.

Monsol, which is derived from a by-product of the Mond power-gas process, differs radically from other coal-tar antiseptics in its selective action. Its power of killing the Streptococcus Pyogenes is *more than* 10 *times greater than that of pure phenol or of lysol.*

Monsol is non-poisonous and non-irritant, and can be applied in effective dilution even to mucous membranes. In view of these facts, it is not surprising that Monsol has been found to have unprecedented qualities in the treatment of Streptococcal infections.

Monsol can be applied to the treatment of septic conditions of the SKIN, the MOUTH and THROAT, and the GENITO-URINARY TRACT.

Monsol
Liquid for dressings, douches, packs, and all sick-room purposes

Monsol Ointment

MONSOL
BRAND
GERMICIDE AND DISINFECTANT

Monsol Capsules
Keratin-coated for intestinal disinfection

Monsol Throat Pastilles

Obtainable of all reputable Chemists in India.
Selling Agents in India: Imperial Chemical Industries (India), Ltd.,
Calcutta, Bombay, Madras, Karachi, Rangoon, Cawnpore, Belgaum, Lahore, Ahmedabad and Cochin.
Manufacturers: The Mond Staffordshire Refining Co., Ltd., Abbey House, Westminster, London, S. W. 1.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

RETIREMENTS.

Colonel W. O'S. Murphy, M.B., I.M.S., from the 4th February, 1929.

Lieutenant-Colonel R. M. Barron, D.S.O., I.M.S., from the 24th March, 1929.

RESIGNATION.

The King has approved the resignation of Captain E. Kean, I.M.S., from the 21st March, 1929.

NOTES.

LIVER EXTRACT (PARKE, DAVIS & CO.).

THE general practitioner who deals with Messrs. Parke, Davis & Co. knows that he is dealing with eminently reliable and efficient drugs, and the policy of this well-known firm with regard to liver extract for the treatment of such conditions as sprue, pernicious and other anæmias, and night blindness has been extremely sound. Their Detroit laboratories have been manufacturing liver extract for some time, but the firm decided not to put their preparation on the Indian market until they were satisfied that it would stand Indian climatic conditions.

Their final product has proved to withstand the factors due to climatic conditions, and is a great improvement in the original product. By improved methods they have been able to produce a highly concentrated extract of which 2 grammes (grains 32), are equivalent to 100 grms. of fresh liver. This is stocked at Rs. 20 per box of 24 vials subject to usual discount. Messrs. Parke, Davis & Co., Lloyd Buildings, Graham Road, Ballard Estate, P. O. Box 88, Bombay, will be glad to supply medical practitioners in India with information regarding this product.

PICTORIAL PERFECTION IN PHOTOGRAPHY.

THE advance made in artistic photography during the past few years is very noticeable. So soon as the amateur of to-day passes the snapshotter stage the impulse is to produce pictures which by general consent will be considered works of art. Perfection is always a worthy objective and the photographer by striving towards that end, in time, approaches the unattainable, to the general advancement of photography.

Let no amateur photographer hold back because he thinks he has not sufficiently mastered manipulative methods and technicalities to produce really creditable pictures. Happily photography has progressed along scientific lines to such a degree and has been so simplified in its progression, that the only photographer who need remain unsuccessful is the one who refuses to take advantage of this simplification.

A booklet recently published—*Pictorial Perfection in Photography*—shows convincingly how simple it is to master the technical details which are the foundation of artistic pictorialism. To increase the beginner's interest in his hobby and give very useful information to those already familiar with the elementary principles of photography, the publishers of this booklet set forth the ease with which the amateur can avoid poor results. Every camera owner will find much to interest him, especially the sections on exposure and colour photography. The booklet is well illustrated with explanatory photographs and many pages in colour.

The whole of the thirty-six pages is somewhat of a revelation, both as to the amount of information condensed into such convenient space and to the possibilities of artistic results achieved by development. After-treatment of negatives, enlarging and development without a dark-room are dealt with at length. A section explaining the colour effects obtained by toning opens up new and fascinating methods for the production of coloured photographs.

The helpfulness of the booklet will be appreciated by everybody interested in this popular subject. This booklet will be sent post free, to any reader mentioning this paper, by the publishers:—Messrs. Burroughs Wellcome & Co., Snow Hill Buildings, London, E. C. 1.

"ATOCIN."

"ATOCIN" is a product for the treatment of rheumatism, lumbago, and similar conditions recently introduced by the Cavendish Chemical Co., 137, Regent Street, London. The following reports are quoted from *The Lancet* of the 19th November, 1927.

Atocin is indicated for the treatment of rheumatism, gout and lumbago. Whilst the introduction of salicylates was a notable step forward in combating the painful afflictions caused by the different forms of rheumatism, it left untouched many aspects of this malady. In recent years attention has been given to phenylcinchoninic acid and its derivatives—among which is Atocin—and the clinical results obtained appear to be hopeful. When analysed, these tablets were found to contain a substance which possessed the properties of phenylcinchoninic acid with starch as an excipient. Each tablet weighs 9.38 grs., of which amount 7.5 grs. is Atocin.

Atocin with Aspirin.—These tablets, while used for the same purposes as Atocin, are used a great deal with good results for colds, influenza and neuralgia. When examined, they were found to be compounded of 5 grs. of Atocin, 2½ grs. of aspirin (acetyl salicylic acid), starch being used as an excipient. Free salicylic acid was absent.

A STOPPER FOR VACUUM FLASKS.

DIFFICULTIES are frequently experienced in pouring out the contents of insulated flasks built on the *Vacuum* principle, and in this connection our attention has been drawn by the Patris Co., 11, Thornfield Road, Bishop's Stortford, Herts., England, to a most ingenious stopper and pourer for such flasks, which they manufacture. In the ordinary type of flask drops of fluid may accumulate inside the metal case when the contents are poured out, and there cause rusting of the case. The "Patris pourer" is designed to give a steady thin stream of fluid in pouring, free from the disadvantages of pouring out the contents of the flask over a thick glass rim. *The Lancet* writes of this stopper that "it allows the liquid to flow in a steady stream; splashing is entirely prevented. The device will be appreciated by the user of the vacuum flask for ordinary purposes, and especially by the sick-room attendant, who may have to supply an invalid with a warm liquid at intervals."

Sets of samples of assorted sizes have been prepared for the Eastern markets at 6 for Rs. 5. The device appears to be ingenious; it consists essentially of a double-lipped tube of specially annealed glass with a jacket and stopper of tough cork, the complete pourer fitting under the metal cap, so that it need not be removed, except for the purposes of cleaning and sterilisation. It is made in different-sized gauges to fit the different sizes of vacuum flasks on the market.

MESSRS. BEHRING AND CO.

BEHRINGWERKE, Marburg. Lahn, Germany—the well known firm of manufacturers of anti-diphtheritic serum, anti-sera, vaccines, and other specialities—announce the issue of a booklet dealing with their manufacture of sera and vaccines in general, in which full particulars are given. The firm was founded by the famous Emil von Behring, whose work on anti-diphtheritic serum is classical.

They will be glad to supply copies of this booklet to members of the medical profession in India on application to the above address.

WATSON'S MICROSCOPE RECORD.

THE *Microscope Record*, published quarterly by Messrs. W. Watson & Sons, Ltd., 313, High Holborn, London, W. C. 1, is a real journal (and not merely a trade publication) of outstanding merit, and of interest to microscopists and laboratory workers alike.

In the issue for January, 1929, Mr. A. E. Clarence Smith, M.A., A.I.C., deals with the problem of exposure in photomicrography, giving a copy of Hurter and Driffield's "characteristic curve" diagram; the worker in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

this particular line will find much of interest in this article. Mr. H. E. Hurrell, F.R.M.S., gives an account of fresh-water polyzoa; and Mr. A. A. C. Eliot Merlin continues his "hints to beginners." This last article is one which we commend not only to beginners in microscopy, but to the man who has been accustomed to use his microscope for years as well. It is almost incredible that medical men should take to microscopic work without any information about the optical principles of the microscope, yet the majority of medical men do so. Mr. Merlin emphasises the necessity for a centring sub-stage condenser; to the trained microscopist this is essential, but the student may very well be content with a built-in and non-centring sub-stage condenser. The Abbé, of course, is in universal use; but we agree that experienced workers may not be satisfied with it. The paragraphs dealing with fine adjustments are worthy of consideration; a fine adjustment that has to bear the whole weight of the body of the microscope and of the coarse adjustment needs to be of far more substantial construction than one which has to bear a lesser strain. In spite of the fact that present-day microscopes are almost standardised in construction, there is still a vast field for further experiments in design. Two classes of microscope are wanted; the first, a fool-proof model for students—(this has practically been evolved by almost all well known manufacturers, though a continental model which requires the use of *both* hands for working the mechanical stage, thus leaving none free for the fine adjustment, strikes us as about a century out of date); the second a model for the research worker who wants to get the most critical work out of his microscope. The latter will usually work by artificial light (even in the tropics), and he will require a centring sub-stage condenser, apochromatic objectives and compensating oculars. There is an immense difference between results under the two different conditions.

The Rev. D. P. Fuge contributes an introductory note to the genus *Coscinodiscus*, and Mr. Chapman Jones, F.I.C., F.C.S., HON. F.R.P.S., defines a microscopist's method of testing objectives. The Editor discusses the problem of getting the best out of the Abbé sub-stage condenser by way of illumination; it is often forgotten that the Abbé was originally invented for the purpose of producing such brilliant illumination of sections of stained tissues that the stained bacteria within them would appear brightly illuminated, whilst the image of the tissue would be so bright as to be negligible. To-day, the Abbé is used for entirely different purposes, and for critical work it compares very unfavourably with achromatic aplanatic condensers of the English type. Again, we see that the present-day microscope is by no means standardised, and that big advances may be expected in the near future.

"Notes and Queries"—chiefly answers to correspondents—complete the number. This journal (which is supplied free by Messrs. Watson and Sons on application) is one of cardinal importance to microscopists.

THE TREATMENT OF AMŒBIC DYSENTERY.

WHILST the clinical treatment of a case of acute amœbic dysentery is a straight forward matter, the eradication of a chronic intestinal infection with *E. histolytica* is quite another matter.

And in this connection Messrs. Burroughs, Wellcome and Co., have recently issued a small and interesting little brochure dealing with their preparations for use in this condition. It is a small brochure which is well worth the study of the medical profession in India, for one knows that with this firm their drugs are what they purport to be. The history and use of emetine is first dealt with; then that of emetine bismuthous iodide. A section follows on the uses of emetine in conditions other than amœbiasis—e.g., in schistomsomiasis, bronchitis, and oriental sore. Kurchi bark is then considered; then Quinoxyl; and finally "Kharophen"—an arsenical preparation.

The pamphlet is studiously moderate in its claims for the different preparations described, and gives the chemical composition of the different remedies named. It will be of interest to the general practitioner as giving him some indication of the different uses and values of these drugs, and how and under what circumstances to use them.

MESSRS. BAIRD AND TATLOCK (LONDON), LTD.

MESSRS. BAIRD AND TATLOCK, the very well-known firm of laboratory furnishers and suppliers of standard scientific apparatus, ask us to announce that they have recently opened an Eastern Branch under Mr. G. W. Gosling, at Avenue House, Chowringhee Square, Calcutta; P. O. Box 2169, Calcutta. There are very many laboratories and hospitals in India which deal with this celebrated firm, and who will be glad to know of that a local branch for India and the East has been opened.

Mr. Gosling will shortly be proceeding to England and will be pleased to give his attention to any orders or indents placed either with the Indian branch or direct with the head office in London.

A STERILISING HYPODERMIC SYRINGE CASE.

IT is a very common custom for medical practitioners to sterilise their hypodermic syringes by washing them through with absolute alcohol. The Goldstein Manufacturing Co., Buffalo, New York, however, have gone one better in designing a sterilising hypodermic syringe case which can be carried clipped into the pocket like the ordinary large size of fountain pen. This case has a screw-on cap with a clip, exactly like that of a large fountain pen; inside the barrel of the case is protected by a rubber sheath inside which the hypodermic syringe fits in order to prevent breakage, whilst the hypodermic needle is further protected by a brass shield and remains always in a bath of alcohol surrounding the entire needle. The apparatus appears to be very ingenious, for the syringe when withdrawn has its rustless needle sterilised by alcohol and is ready for immediate use. The price, fitted with a standard pattern 2 c.c. syringe, is $4, whilst there is a special pattern for insulin syringes.

The same firm also manufacture a somewhat similar vest pocket alcohol-containing thermometer case for holding clinical thermometers. It is claimed that with this case the thermometer can be withdrawn and re-inserted 100 times with one filling of the case with alcohol, and each time is ready sterilised for insertion into the patient's mouth. This is listed at $3.50, fitted with a one-minute thermometer.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India. Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

THE IMPORTANCE OF SECONDARY INFECTIONS IN THE CAUSATION OF FILARIAL LYMPHANGITIS.*

By H. W. ACTON,

LIEUTENANT-COLONEL, I.M.S.,

Director, and Professor of Pathology and Bacteriology,

and

S. SUNDAR RAO, L.M.P.,

Filariasis Research Worker (Darbhanga Scholar), Calcutta School of Tropical Medicine and Hygiene.

OF the different lesions caused by *Filaria bancrofti* in man, filarial lymphangitis is the most common, and unfortunately the most troublesome affection. The actual mechanism by which filarial lymphangitis is brought about has not hitherto been clearly understood.

The authors have been engaged on a detailed study of the ætiology of lymphatic obstruction in filariasis during the past two years, both by a study of post-mortem material, and also from clinical experience with a large series of cases.

During the course of these studies, it was found that lymphatic obstruction in filarial disease is produced in one of the following ways:—

1. A chronic condition of obstruction brought about during the course of several years by the worms damaging the lymphatic glands during their passage through them, and thereby changing the glands into a granulomatous mass.

2. An acute inflammatory change in and around the glands which are already damaged by the worm. This inflammation is caused by pyogenic cocci coming to the glands through the blood stream from some septic focus existing in the body. These cases are like the elephantiasis nostras of Europe and the development of the obstruction is very rapid and accompanied by bursts of fever, and cellulitis or periadenitis.

Of the two types mentioned above, the inflammatory type is the most common one, forming, as we found from a study of the outdoor cases at the Calcutta School, 95 per cent. of the total admissions for filarial disease. The present paper deals only with this type of lymphangitis and shows the results of investigations carried out with a view to determining the nature of these septic foci and their location. A detailed examination of every case of filarial lymphangitis and chyluria was carried out during the past two years and it was found that in all cases the source of infection is some definite septic focus.

In all the cases that were studied, the acute attack was invariably due to secondary organisms, viz., streptococci or staphylococci; the source from which these organisms got into the damaged lymphatics was a matter that had to be determined by us. In order to ascertain the exact source from which these pyogenic organisms invade the blood stream, a very detailed examination of all cases was made for the discovery of any septic focus in the body. In every one of the cases examined one or more foci of infection existed, these undoubtedly served as the source of supply of the secondary organisms that were responsible for the acute attack of lymphangitis.

The cases discussed here were those admitted into the Carmichael Hospital for Tropical Diseases, Calcutta, for acute symptoms of lymphangitis, abscess following lymphangitis, elephantiasis or chyluria, and these were not selected of an examination of the blood for thorough examination was made both clinically and bacteriologically. Routine laboratory tests were carried out in every case, and these consisted of a complete examination of the blood for malarial parasites, the Wassermann and Widal reactions, the aldehyde and antimony tests, agglutination against dysentery bacilli of Shiga and Flexner, and the night blood for microfilariæ. Total and differential leucocyte counts were also made. Cultures of the stool and urine were made for non-lactose fermenters and for streptococci, besides the routine examination of stools for protozoa and ova, and the urine for any abnormality. In addition to these bacteriological tests, a clinical examination was made of the mouth for the presence of pyorrhœa alveolaris and for caries of the teeth, as well as an *x*-ray examination of the roots for periodontitis. Examinations of the ear, nose and throat of these cases were done by the specialist. Twenty-eight cases were examined in detail in the manner mentioned above and the findings are presented in this paper. In this connection the authors are indebted to Lieut.-Colonel J. A. Shorten, I.M.S., for his help in carrying out the *x*-ray examinations of the teeth, and to Dr. Judah, F.R.C.S. for the ear, nose and throat examinations.

As a result of these detailed examinations for the presence of septic foci in these cases, it was found that two types of foci form the source of the secondary organisms. These are:—

1. External foci, usually temporary, as for example, a traumatic lesion or a tinea infection, with secondary streptococcal infection.

2. Internal and more permanent foci, e.g., pyorrhœa alveolaris, caries of the teeth, periodontitis, septic tonsils or intestinal ulceration.

In all the cases, the source of the secondary infection is found to exist in the mouth, either as carious teeth, periodontitis, apical infection or septic tonsils. In many of these cases, streptococci were isolated from these foci.

* Being a paper read at the Medical and Veterinary Research Section of the Indian Science Congress held at Madras in January 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In six of the above cases, the laboratory examination also revealed intestinal infection with *Entamœba histolytica*, hookworms, or streptococci, and in five of these cases streptococci or *Staphylococcus mollis* were also isolated from the bladder.

Acton and Knowles (*Dysenteries in India*—1928) have shown how lesions of *E. histolytica* infection in the gut act as a seat of septic inflammation from which bacterial emboli may occur and settle in different parts of the body giving rise to various inflammations, such as myositis, sciatica, etc. The mechanism of infection described by these authors by which secondary sequelæ are produced through the absorption of the secondary organisms from these lesions and thereby producing symptoms, applies to filarial lymphangitis as well.

External Foci.

The external foci are chiefly temporary in nature. The percentage of occurrence of this type of focus in this series is small; out of a total of 28 examined only 9 were of this class. The chief forms of such foci are (1) skin disease like tinea of the feet with secondary streptococcal infections, or streptococcal dermatitis; (2) cuts, bruises, or abrasions that had become septic.

The discovery of the focus of secondary infection in filarial lymphangitis is of much more than academic interest. It has a definite bearing on the question of treatment of filarial lymphangitis. We have invariably found that by the removal of the focus, e.g., an apical abscess, or by the treatment of the focus, e.g., a dysenteric ulcer, the acute attacks disappear and the patients remain free of lymphangitis for years, at other times the attacks of lymphangitis are greatly reduced in severity and frequency.

In these cases the course of treatment consisted in treating these foci surgically or by local applications, followed by a course of auto-vaccines when possible, or a course of stock mixed streptococcus and staphylococcus vaccines.

TABLE.

Serial number.	Patient.	Age.	Race.	Sex.	Disease.	Microfilaria in the peripheral blood.
1	Mrs. C. ..	25	A. I.	F.	Filarial lymphangitis, right leg	
2	Mr. N. L. D'c ..	40	A. I.	M.	Do. scrotum	
3	Mrs. A. A. ..	32	A. I.	F.	Do. right leg	
4	Mrs. V. G. R. ..	28	A. I.	F.	Do. right leg and abscess.	+
5	Babu R. N. ..	18	I. Ch.	M.	Do. both legs	
6	Mr. R. T. ..	44	A. I.	M.	Do. scrotum	
7	Miss I. A. ..	22	Jewess	F.	Do. both legs	
8	Miss E. W. ..	33	A. I.	F.	Do. right leg	
9	Mr. W. A. ..	23	A. I.	M.	Do. left leg	
10	Mr. A. R. V. ..	44	A. I.	M.	Do. both legs	
11	Babu R. C. ..	53	H.	M.	Do. right leg	+
12	Babu R. R. R. ..	27	H.	M.	Do. left leg	
13	Mr. H. T. ..	31	A. I.	M.	Do. right leg	+
14	Mrs. C. ..	20	Jewess	F.	Chyluria	
15	Mrs. E. C. ..	48	A. I.	F.	Filarial lymphangitis, both legs	
16	Mr. E. J. ..	19	Jew	M.	Do. left leg	+
17	Mr. A. S. ..	29	A. I.	M.	Filarial lymphadenitis, right leg.	
18	Mrs. M. ..	62	E.	F.	Elephantiasis, both legs	
19	Mr. M. M. S. I.	45	Pers.	M.	Chyluria	
20	Miss T. C. ..	18	E.	F.	Elephantiasis, both legs	+
21	Mrs. M. D. ..	55	A. I.	F.	Chyluria	+
22	Mrs. I. C. ..	27	Jewess	F.	Do.	
23	Mrs. T. ..	40	A. I.	F.	Filarial lymphangitis, right leg	
24	Mrs. M. ..	42	E.	F.	Filarial lymphadenitis, left epitrochlear.	
25	Babu B. K. ..	36	H.	M.	Chyluria	
26	Mr. P. L. ..	26	A. I.	M.	Filarial lymphangitis, right leg	
27	Mr. R. K. ..	45	E.	M.	Do.	
28	Miss N. ..	23	Arm.	F.	Lymphadenitis, right leg and abscess, right foot.	

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Serial number.	Internal Focus. Teeth.	Gums.	Tonsils.	Throat.	Bowels.	Bladder.	External focus location.	Remarks.
1	*5	..	..	+	..	..		
2	6	+	+	+	..	..	Tinea cruris, both groins	
3	3	..	+	..	Streptococcus	..		
4	4	..	..	..	..	*B. coli*	..	
5	1	+	+	+	..	..	..	
6	3	+	+	..	Streptococcus	..	..	
7	5	..	..	+	..	*Staphylococcus aureus.* Coliform bacillus.	Tinea cruris, both groins ..	Dermatitis; external ear, slight perforation; tympanum left ear.
8	8	+	+	..	..	..	Septic shoe-blister left leg.	
9	5	+	+	..	..	..	..	
10	2	..	+	+	Streptococcus	*Staphylococcus mollis.*	..	
11	3	+	..	..	..	..	Streptococcal dermatitis, right leg.	
12	4 (marked Alv. abs.)	+	+	+	*E. histolytica* cysts.	..	..	
13	2	..	+	..	..	..	Tinea, toes, both feet	
14	3	..	+	+	..	..	..	
15	3	..	+	+	..	..	..	Streptococci isolated from throat.
16	1	..	+	..	..	..	Septic shoe, blister left leg.	
17	3	..	..	..	Hookworm	..	..	
18	1 (Tartar)	+	..	+	..	*B. lactis ærogenes.*	Tinea, toes, both feet	Do.
19	2	..	+	..	..	..	..	
20	4	..	+	..	..	..	..	
21	4 (Tartar)	..	..	+	..	..	..	Streptococci isolated from teeth.
22	3	..	+	+	..	..	..	
23	4	+	+	..	..	..	..	
24	2 (apical abscess)	+	+	..	..	..	..	Do.
25	6 (Tartar)	..	+	+	..	..	..	
26	4	+	..	..	..	..	Tinea with streptococcal infection, right foot.	
27	2	..	+	+	..	..	..	
28	3	..	+	..	*E. histolytica* cysts.	..	Trauma, right foot sepsis.	

* Figures indicate the numbers of roots affected.

SUMMARY.

Lymphatic obstruction in filarial infection has been found to be of two types: (*a*) a chronic type caused by the worm damaging the lymphatics and glands and usually an aseptic condition; and (*b*) acute inflammatory lymphangitis caused by a secondary infection with streptococci and staphylococci. The latter type is the more prevalent one, and the secondary organisms are derived from some septic focus in the body; these foci are of two kinds: (1) internal and more or less chronic, e.g., septic tonsils; and (2) external and generally temporary. The internal foci are commoner and their recognition is very important in the treatment of filarial lymphangitis, because by eradicating these secondary foci there is no further danger of acute bursts of cellulitis, etc., nor will the elephantiasis attain a great size.

The evidence in favour of our view, that most of the acute cases of lymphangitis are due to sepsis, may be summarised as follows:—

(1) A septic focus can always be found from which we can recover a pyogenic coccus.

(2) The irritation produced by the worm causes a break-down locally in the tissue defence mechanism (kataphylaxia). These sites form a suitable nidus for the lodgement of these cocci.

(3) The same coccus can be recovered from the inflammatory site as from the septic focus.

(4) Furthermore, it can usually be recovered from the urine also, showing that it must have invaded the blood stream.

(5) Eradication of the septic focus, followed by immunisation, prevents periodic attacks and the development of elephantiasis.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TETRACHLORETHYLENE IN THE TREATMENT OF HOOKWORM DISEASE.

By P. A. MAPLESTONE, D.S.O., M.B., Ch.B., D.T.M.,

and

A. K. MUKERJI, M.B.

(From the Hookworm Research Laboratory, Calcutta School of Tropical Medicine. Supported by the Indian Jute Mills Association.)

Following the success of carbon tetrachloride in the treatment of hookworm disease, Hall and Shillinger (1925), as the result of animal experiments, suggested that tetrachlorethylene (C_2 Cl_4) might be even more efficacious.

The first report of its use on human beings was that of Lambert (1925). He gave the drug to three series of cases in doses of 2 c.c., 3 c.c. and 4 c.c. respectively. He tested the efficiency by giving a dose of tetrachlorethylene and counting the worms removed during the subsequent twenty-four hours. One week later he gave a dose of 3 c.c. of oil of chenopodium to the same people and counted the worms removed by this treatment, and the number of worms removed by the tetrachlorethylene is expressed as a percentage of the total number removed by the two treatments. In this way he found that 2 c.c. of tetrachlorethylene removed 36 per cent. of the worms from four patients, 3 c.c. removed 77 per cent. of worms from four patients, and 4 c.c. removed 94 per cent. of worms from five patients. His final conclusion is that tetrachlorethylene has no advantage over carbon tetrachloride from any point of view.

The next record of the use of this drug on human beings is that of Soper (1926). He examined the efficiency of the drug from the point of view of selective action on the species and sexes of hookworms, and he concludes that tetrachlorethylene offers no advantages over carbon tetrachloride in the case of Necator, but he suggests that it should be tried in places where Ankylostoma is the predominant species.

Schapiro and Stoll (1927) tried the drug at Penonome, Panama, when its efficiency was tested under field conditions. They first took a series of test cases in which several egg counts were made before and after treatment, and in nine patients who received doses of 3 c.c. of tetrachlorethylene the egg output was reduced by 93 per cent., and in five patients who received 2 c.c. the egg output was reduced by 88 per cent. In cases in the field on which single egg counts were made before and after treatment, it was found that 3 c.c. reduced the egg count by 81 per cent. and 2 c.c. reduced it by 77 per cent. Fractional doses in children under 16 years of age gave an egg reduction of 53 per cent. They also give the results of combined treatment with fractional doses of tetrachlorethylene and oil of chenopodium, and they obtained a 75 per cent. reduction. Tetrachlorethylene was inactive against Ascaris, as tested by egg reduction, and they claim it is more active against Trichuris than is oil of chenopodium, as there was an egg reduction of 26 per cent. with the former drug against 23 per cent. with the latter, but this difference appears too slight to be of any real evidence of superiority. They consider that tetrachlorethylene merits further trial as an anthelmintic, but they express no opinion as to its efficiency compared with that of carbon tetrachloride.

Brosius, Peon, and Carroll (1927) treated twenty-four cases at Almirante, Panama. These cases were treated in hospital and their report is of considerable interest because a record of toxic symptoms arising from the drug was kept. There was dizziness in 11 cases, dizziness with abdominal pain or cramp in 6, abdominal pain or cramp in 3, nausea in 1, and vomiting of the drug in 1. Only three cases of the twenty-four exhibited no symptoms. In the stools of seven of these cases no hookworms were found after treatment, but all but two cases were negative for eggs on three examinations after treatment, therefore a cure rate of 91.7 per cent. is claimed for this series of cases.

A supply of tetrachlorethylene in soft gelatine capsules of ½ c.c. capacity was sent to the Calcutta School of Tropical Medicine by a firm of manufacturing chemists, with a letter requesting us to try the efficiency of the drug in this form. It was tried in various ways, alone or combined with oil of chenopodium, and the efficiency of the different methods was tested by means of a single egg count before treatment and a single egg count at least ten days after treatment. With the exception of nine cases in group 3, Table I, who were under sixteen years of age and consequently received graduated doses of both drugs, all the patients referred to had the full dose of 3 c.c. or 6 capsules of tetrachlorethylene, and, when given, 1 c.c. of oil of chenopodium in a hard gelatine capsule. The only purgative used was 1 oz. of saturated solution of magnesium sulphate.

It is seen that the percentage reduction in eggs is much greater in group 2 than in group 1, although the number of cures is lower. The reason of the greater egg reduction in group 2 is probably because the purgative given at the same time as the capsules would tend to move them past the site of the worms before they became dissolved and so the drug would not be liberated in time to act on the worm to the best advantage. Although the percentage reduction in eggs in group 2 is very high, it is certainly somewhat lower than it appears in the table. This is because egg counts of two preparations of each stool only revealed a single egg in each of three slides, but eleven of the cases were positive by

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Lane's direct centrifugal flotation method. In other words eight of the twelve cases were negative by Stoll's count, whereas only one case did not contain eggs as demonstrated by Lane's method. It should be borne in mind that in all the groups the number of cures has been estimated by Lane's centrifuge, and in none of the other instances which have been quoted for comparison has this method been employed. The great superiority of Lane's method over any other for demonstrating light infectious is quite sufficient to explain the low percentage of cures in the writers' cases. It was the discovery of the ridiculously low rate of complete cure that even the most powerful vermifuges bring about when checked by the direct centrifugal flotation method that led the writers to make use of the percentage reduction in eggs as a test of drug efficiency.

before and after treatment available; but all the cases have been tested for cure by the direct centrifugal flotation method so this gives a basis for comparison. Although, as seen from Table I, the percentage of egg reduction and percentage of cures do not seem to be in any way dependent on each other.

As far as Tables I and II are comparable it seems that carbon tetrachloride is more efficient than tetrachlorethylene, except in the case of group 2, Table I, where capsules of tetrachlorethylene followed by the purgative gave over 90 per cent. egg reduction. Enquiry as to the price of these capsules even at wholesale rates revealed the fact that a dose of 3 c.c. of tetrachlorethylene in this form is nearly eighteen times as expensive as an equal dose of carbon tetrachloride given in water. Therefore, even if it might be a little more efficient, the price of tetrachlorethylene

TABLE I.

Results of a single treatment with the drugs indicated in each group. The egg counts are shown as the total in each group and they are the actual total, not the estimate of eggs per gram.

Group.	Treatment.	Purgative.	Number of cases.	Egg Count.		Percentage reduction.	Number cured.	Percentage cured.
				Before.	After.			
1	Tetrachlorethylene in capsules.	At same time	16	58	19	76·2	3	..
2	,,	2 hours later	12	107	3	97·2	1	..
3	,, and oil of chenopodium.	,,	34	566	157	72·3	8	..
4	Tetrachlorethylene removed from capsules.	,,	12	325	214	34·1	2	..
5	,, and oil of chenopodium.	,,	8	252	124	59·8	3	..
	TOTAL ..	..	82	..	..	..	17	20·7

It was considered that tetrachlorethylene given in the soft capsules in which it was supplied would tend to make it more efficient than when given in the free state in water or other vehicle, because the capsules dissolve in the duodenum and would thus liberate the drug at the desired site of operation in much greater concentration than when it reached there mixed with stomach contents. It is probable that this did occur, for in no case were undissolved capsules found in the stools. Therefore, so that the tetrachlorethylene should not have an undue advantage over carbon tetrachloride, which is always given in water at this hospital, a certain number of capsules were cut open and a dose of 3 c.c. of the drug was given in exactly the same way. The figures for carbon tetrachloride treatment that are given below in Table II have been taken from our hospital records, and in only a portion of one group are egg counts

in capsules would render it of no practical use on a large scale.

Cases which were treated in hospital and in which toxic effects of the drug could be watched for numbered thirty-eight who received tetrachlorethylene alone, and thirty-seven who received tetrachlorethylene with oil of chenopodium. In the first group, 6 complained of giddiness, 1 vomited, and 1 appeared drowsy; in the second group 19 showed giddiness, 4 vomited, and 3 appeared drowsy. These results are approximately the same as we get with carbon tetrachloride.

The results of our investigation are in complete agreement with those of the other workers to whose papers reference has been made, and we do not consider that tetrachlorethylene is in any way superior to carbon tetrachloride as an anthelmintic. Indeed, it seems that it might not be quite so powerful in removing hookworms as is the latter drug.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE II.

Results of a single treatment with 3 c.c. of carbon tetrachloride with or without 1 c.c. of oil of chenopodium in a hard gelatine capsule. The purgative in all cases was 1 oz. saturated magnesium sulphate.

Group.	Treatment.	Purgative.	Number of cases.	Egg Count.		Percentage reduction.	Number cured.	Percentage cured.
				Before.	After.			
1	Carbon tetrachloride and oil of chenopodium.	2 hours after.	19	266	31	88·35	5	26·3
2	Ditto ..	,,	50	..	..	..	27	54
3	Carbon tetrachloride alone.	,,	32	..	..	..	13	40·6
4	Carbon tetrachloride alone.	At same time	34	..	..	..	19	56
	TOTAL ..	....	135	..	..	..	64	47·4

There is one factor, however, that has not yet been fully investigated, and that is the relative toxicity of the two drugs, and should tetrachlorethylene prove less toxic than carbon tetrachloride, it would be a very valuable substitute for the latter. A recent paper by Lamson, Robbins and Ward (1929) indicates that possibly tetrachlorethylene is not as dangerous as carbon tetrachloride. After a large number of experiments on animals they have come to the conclusion that tetrachlorethylene is not absorbed from the animal's intestines, and that when it does enter the circulation by inhalation, it has none of the pathological effects on the liver and kidneys that are exhibited by carbon tetrachloride.

It seems probable that a certain amount of tetrachlorethylene is absorbed from the human intestine, for the clinical observations of Lambert, Brosius *et al*, and the writers are in agreement, that similar signs are observed to those following the use of carbon tetrachloride. There have not yet been any fatalities from tetrachlorethylene, so it is not possible to say if the drug has any damaging action on the liver. The experiments of Lamson and his co-workers suggest that if there were damage at all, it would be slighter than that from carbon tetrachloride. It is therefore possible that tetrachlorethylene, even if absorbed from the intestine in sufficient amount to cause signs of slight intoxication, would not cause the later gross damage to a liver usually already slightly damaged, and as it is the latter condition and not the former which is the real danger of carbon tetrachloride, tetrachlorethylene may prove a safer drug.

REFERENCES.

Brosius, O. T., Peon, I. E. and Carroll, R. L. (1927). Tetrachlorethylene in Uncinariasis, a preliminary report. *United Fruit Company. Medical Department, 16th Annual Report*, 1927, p. 183.

Hall, M. C. and Shillinger, J. E. (1925). Tetrachlorethylene, a new anthelmintic. *American Journ. Trop. Med.*, Vol. 5, p. 229.

Lambert, S. M. (1925). Tests with Tetrachlorethylene, a new anthelmintic. *Med. Journ. Australia*, Vol. 2, p. 699.

Lamson, P. D., Robbins, B. H. and Ward, C. B. (1929). The Pharmacology and Toxicology of Tetrachlorethylene. *American Journ. Hyg.*, Vol. 9, p. 430.

Schapiro, Louis and Stoll, N. R. (1927). Preliminary note on the anthelmintic value of tetrachlorethylene based on egg counts before and after one treatment. *American Journ. Trop. Med.*, Vol. 7, p. 193.

THE USE OF FIBROLYSIN IN LEPROSY.

By NORBERT FIGUEREDO, M.B., B.S.,
Assistant Medical Officer, Acworth Leper Asylum, Bombay.

FIBROLYSIN, as stated by the manufacturers, is a compound of thiosinamine and sodium salicylate and is credited with the powers of dissolving fibrous tissue. It is said to be of some use in veterinary surgery and has also been used in general surgery to dissolve scar tissue.

With regard to its use in leprosy, Dr. Otto Krause in his paper, "How to make old leprosy cases accessible for treatment like one or two year old cases," read before the Medical Congress, held in Bloemfontein in March 1928, says

"The great difficulty with leprosy is that old cases resist where cases of one or two years' standing will yield to treatment with chaulmoogra oil or hydnocarpus oil.

"I have now found a method to convert old cases into new ones, and also to quicken the treatment of new cases.

"I started with the following theory:— Through the action of the bacillus, fibrous tissue is formed. In this tissue the circulation is bad and the bacillus has a splendid shelter in the same, the chaulmoogra oil cannot

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

attack it in full force. The toxin which the bacillus produces further poisons the system.

"A remedy which will dissolve the fibrous tissue will expose the bacillus to be attacked by the remedy. This I find to be 'Fibrolysin' (obtainable from E. Merck, Darmstadt, Germany) which is known to dissolve the fibrous tissue. I injected the fibrolysin intramuscularly for 4 to 6 weeks twice a week, then stopped for 1 or 2 weeks, then continued again until the desired effect was produced: at the same time the treatment with the oil was continued, sometimes by the mouth or through intramuscular injections.

"Massage quickened and facilitated the progress. The result was very encouraging, but as I have only private cases and a limited number, I would like to see the treatment carried on in leprosy institutions. In nervous cases of leprosy, the result was still more encouraging. I hold that the bacillus does not so much destroy the nerve but the sheath of the nerve, and through the formation of fibrous tissue, shrinking of the sheath occurs and the nerve is killed by pressure."

The same treatment is also referred to by Henderson and Chatterji (1928).

To explain the dissolving action on the fibrous tissue in leprosy, credited to fibrolysin by Dr. Otto Krause, a brief account of the formation of this tissue in nodules and nerves in lepers, as summed up by Dr. Muir (1928), may be given.

"Whenever a bacillary embolus lodges in the corium of the skin, there is a reaction caused in proportion to the size of the embolus and the reaction-producing power of the surrounding tissues. When the reaction is marked, a round nodule is formed. If this nodule does not persist, it may be called a temporary nodule. But if the reaction produced is very severe, fibrous tissue may be formed to a degree sufficient to prevent the spread of infection, and a more or less permanent nodule is formed. Permanent nodules are also formed as the result of lodging of fresh emboli inside the area of a pre-existing lesion. The fibrous tissue, which has already been formed, blocks the spread from the new embolism and brings about this result.

"A section through a nodule shows fasciculi and spaces containing connective tissue and round cells. Bacilli are found in the spaces between the cells, but not to any extent between the fibrous tissue strands."

"Nerve lesions are of two types. the fibrolysin dissolves the fibrous tissue round the nodule and sets free the bacilli, which are, in turn, acted upon by the chaulmoogra oil. Here, then, is one indication for the use of fibrolysin.

"Nerve lesions are of two types(2) Ascending—here the lesion is due to a spread of infection from a lesion of the corium of the skin into the sensory nerve endings and so along the nerve trunks. Metastatic—here the infection reaches the nerve trunks as a result of bacillary embolism of the vasa vasorum of the perineurium. Further extension results from the organisms passing up the sheaths of the nerves. In both, there results a formation of granulation, and later of fibrous tissue. The true nerve elements are constricted and if this pressure continues long enough, the axis cylinders are destroyed."

The fibrolysin is supposed to act on the fibrous tissue formed in the sheath. The second indication, therefore, for the use of fibrolysin would be in cases in which the nerve sheath was undergoing fibrosis but was not completely destroyed.

In choosing the following cases, attention was directed to the stage of the disease in which the above indications were met with.

(I) Cases in which both superficial anæsthetic patches and acroteric lesions (with glove anæsthesia and trophic lesions of the extremities) were present together.

Case 1.—B. K., Hindu male, æt. 30. Duration of disease 10 years.

Lesions.—Anæsthetic patches over the chest and abdomen and back. Acroteric lesions of hands and legs. Thickening of the ulnar and peroneal nerves.

Case 2.—D. R. M., Hindu male, æt. 35. Duration of disease 12 years.

Lesions.—A few patches of superficial anæsthesia on the chest. Acroteric lesions of hands and feet. Thickening of the ulnar and peroneal nerves.

Case 3.—N. R., Hindu male, æt. 42. Duration of disease 12 years.

Lesions.—Patches of superficial anæsthesia on the abdomen and back. Acroteric lesions of hands and feet. Thickening of the ulnar nerves.

Case 4.—D. D., Hindu male, æt. 42. Duration of disease 4 years.

Lesions.—Large patch of anæsthesia on right buttock, a few patches on left arm. Acroteric lesions of hand. Thickening of ulnar nerves.

Case 5.—M. H., Hindu male, æt. 45. Duration of disease 10 years.

Lesions.—Patch of anæsthesia on lumbar region. Acroteric lesions of hands and feet.

(II) Cases in which only secondary nerve lesions were present.

Case 1.—G. B., Hindu male, æt. 51. Duration of disease 15 years.

Lesions.—Acroteric lesions of hands and feet.

(III) Cases in which secondary nerve lesions (acroteric) were present together with nodules showing acid-fast bacilli.

Case 1.—A. G., Hindu male, æt. 42. Duration of disease 7 years.

Lesions.—Nodules on face and ears. Acroteric lesions of feet, thickening of peroneal nerves.

Case 2.—R. R., Hindu male, æt. 50. Duration of disease 5 years.

Lesions.—Tubercular lesions of face and ears. Acroteric lesions of hands and feet. Thickening of ulnar and peroneal nerves.

Case 3.—S. G., Hindu male, æt. 25. Duration of disease 10 years.

Lesions.—Tubercular lesions of face and ears. Acroteric lesions of hands and feet. Thickening of ulnar and peroneal nerves.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(IV) Cases in which only skin lesions were present showing on bacteriological examination acid-fast bacilli.

Case 1.—R. R. K., Hindu male, æt. 30. Duration of disease, 2 years.

Lesions.—Erythematous patches on left arm, small nodules on face.

Note.—After a week's treatment a slight reaction was observed with rise in temperature.

The above cases were treated for four months from 27th November to 31st March, with intramuscular injections of fibrolysin twice a week and chaulmoogra oil once a week. The fibrolysin was given on Wednesdays and Saturdays and the oil on Mondays. In accordance with the procedure adopted by Dr. Otto Krause, the injections were stopped at the end of the first five weeks, namely, on December 31st, and resumed again on 7th January and continued without further intermissions to the end of the period of treatment.

Results.—Except in one case, no reactions were observed. The treatment is still being continued but so far no visible improvement can be found.

If the fibrolysin acted on the fibrous tissue, dissolving it and setting free the bacilli, and if the chaulmoogra oil acted on the bacilli, a certain degree of reaction might be expected. For it is found (Rogers and Muir, 1925) that all drugs that are beneficial in leprosy have the power to produce reaction. In the first stage improvement generally takes place without reaction, but in the second and third stages the aim of treatment is to produce a reaction of a limited degree.

It might be asked why the chaulmoogra oil by itself failed to produce a reaction in the above cases. Here, however, it should be noted that chaulmoogra oil by itself has frequently been found to fail to produce reactions in old standing cases of the type of those selected for this experiment.

In such cases potassium iodide usually has the effect of sensitizing the patients, and then small doses of the oil have produced a reaction, although without the potassium iodide larger injections would produce none.

Lastly, as a contrast the following cases, treated with potassium iodide and with intramuscular injections of chaulmoogra oil, may be described.

Cast 1.—*C. A., Christian male æt.* 45. *Duration of disease, 8 years.*

Lesions.—Patch of anæsthesia on right index finger. Had a patch of anæsthesia on the right leg which yielded to treatment with chaulmoogra oil which was taken off and on for 6 years.

Treatment.

Nov. 1928.	K. I. grs.	Ch. Oil.	Decr. 1928.	K. I. grs.	Ch. Oil.	Jan. 1929.	K. I. grs.	Ch. Oil.	Feb. 1929.	K. I. grs.	Ch. Oil.	Mar. 1929.	K. I. grs.	Ch. Oil.
19	5	..	9	150	..	9	240	4 c.c.	2	240	4 c.c.	8	240	..
20	10	..	14	180	4 c.c.	12	..	4 c.c.	9	..	4 c.c.	9	..	5 c.c.
21	20	..	17	240 R	..	14	240	..	12	240	..	14	240	..
22	30 R	..	18	..	4 c.c.	19	240	Inf.	16	240	4 c.c.	16	..	Inf.
26	30	..	22	240	4 c.c.	23	..	4 c.c.	20	..	Inf.	20	240	5 c.c.
30	40	..	26	..	4 c.c.	24	240	..	21	240	..	26	240	..
Dec. 3	60	..	29	240	4 c.c.	26	..	4 c.c.	27	..	4 c.c.	27	..	5 c.c.
6	90	..	Jan. 2	..	4 c.c.	29	240	..	Mar. 1	240	..	30	240	Inf.
7	120	4 c.c.	5	240	Inf.	30	..	Inf.	2	..	4 c.c.	..	..	..

R = reaction. Inf. = Subcutaneous infiltration. The daily dose of potassium iodide is quoted in grains. From 5th January subcutaneous infiltration with chaulmoogra oil on the dates indicated in the table was instituted in addition to the intramuscular injections.

Results:—The ventral aspect of the index finger has regained sensation. The dorsum is still anæsthetic.

Case 2.—*T. V., Hindu female, æt.* 26. *Duration of disease,* 2 *years.*

Lesions.—Anæsthetic patches on hands. Ulcers on hands. Deep analgesia of feet.

Treatment.

Dec. 1928.	K. I. grs.	Ch. Oil.	Jan. 1929.	K. I. grs.	Ch. Oil.	Feb. 1929.	K. I. grs.	Ch. Oil.	Feb. 1929.	K. I. grs.	Ch. Oil.	Mar. 1929.	K. I. grs.	Ch. Oil.
15	5	..	5	60	4 c.c.	2	..	4 c.c.	26	120	..	13	..	5 c.c.
17	15	..	9	60	4 c.c.	8	120 R	..	27	..	5 c.c.	16	..	5 c.c.
18	15	4 c.c.	10	90 R	..	13	..	4 c.c.	30	125	..	20	..	5 c.c.
20	20	..	12	..	4 c.c.	14	120 R	..	Mar. 2	150	5 c.c.	23	180 R	..
22	30	4 c.c.	16	90	4 c.c.	16	..	4 c.c.	5	150	..	27	..	5 c.c.
24	40	..	19	..	4 c.c.	18	120	..	6	..	5 c.c.	30	180	..
26	60 R	..	25	90	..	20	..	4 c.c.	8	180 R	..	..	..	..
29	60	4 c.c.	30	120	4 c.c.	23	120	4 c.c.	9	..	5 c.c.	..	..	..

On 26th December and 10th January a marked reaction was observed with swelling of the hands and feet.

Results:—The superficial anæsthetic patches on the hands have disappeared. Deep analgesia remains.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Case 3.—R. G., Hindu female, æt. 48. Duration of disease, 5 years.

Lesions.—Patches of anæsthesia on arms and back. Acroteric lesions of hands and legs.

Treatment.

Dec. 1928.	K. I. grs.	Ch. Oil.	Jan. 1929.	K. I. grs.	Ch. Oil.	Jan. 1929.	K. I. grs.	Ch. Oil.	Feb. 1929.	K. I. grs.	Ch. Oil.	Mar. 1929.	K. I. grs.	Ch. Oil.
21	10	..	11	90 R	..	28	150	..	20	..	5 c.c.	20	240	5 c.c.
22	20	..	12	..	4 c.c.	30	..	4 c.c.	21	240	..	23	240	5 c.c.
						Feb.								
23	30	..	14	90	..	2	180	4 c.c.	23	..	5 c.c.	27	..	5 c.c.
29	40	4 c.c.	16	..	4 c.c.	6	..	4 c.c.	27	240	5 c.c.	30	240	5 c.c.
									Mar.					
Jan. 2	50	4 c.c.	18	110	..	8	210	..	2	240	5 c.c.	..	..	..
4	60 R	..	19	..	4 c.c.	9	240	4 c.c.	6	..	5 c.c.	..	..	..
5	..	4 c.c.	21	140 R	..	13	..	5 c.c.	9	240	5 c.c.	..	..	..
9	..	4 c.c.	23	..	4 c.c.	14	240	..	13	..	5 c.c.	..	..	..
10	60	..	26	..	4 c.c.	16	..	5 c.c.	16	240	5 c.c.	..	..	..

Results:—The anæsthetic patches have disappeared. The acroteric lesions are present.

It is to be noted that potassium iodide and chaulmoogra oil were given in doses varying with the degree of vitality and the general condition of the patients treated. The large doses of potassium iodide were well tolerated when the patients were made to undertake manual labour.

Conclusion.

The treatment of leprosy with the aid of fibrolysin as recommended by Dr. Otto Krause failed to produce any signs of improvement after a continuous trial of four months in nine old cases, which were not converted in the manner described by Dr. Otto Krause into new cases by the use of fibrolysin. The treatment also failed in one case of two years' standing only.

REFERENCES.

Henderson, J. M. and Chatterji, S. P. (1928). *Indian Med. Gaz.*, Vol. LXIII, p. 620.
Muir, E. (1928). *Six Lectures on Leprosy.* School of Tropical Medicine and Hygiene, Calcutta.
Rogers, Sir Leonard and Muir, E. (1925). *Leprosy.*

THE SUPERIMPOSED BLOOD AGAR SLOPE.*

By S. N. GORÉ, L.M. & S. (Bom. Univ.),
Assistant Director, Haffkine Institute, Bombay.

IT is not an exaggeration to state that had not the solid media surfaces been made available in test tubes instead of in Petri dishes, bacteriological work in the tropics would have been hampered considerably; and an instance of this hampering forms the subject of another paper.(1) Tubed media are much more serviceable than plated ones owing to the great liability of the latter to aerial contamination, especially in the tropics; this susceptibility becomes much greater when the medium contains blood or serum. Again, plated media cannot be stored for any length of time and have more or less to be freshly poured.

In general bacteriological work, next to nutrient agar, blood agar is the medium which is most commonly required either for the growth of special organisms or for the observation of hæmolysis or the primary isolation of bacteria.

Blood agar slopes as ordinarily made require a fair amount of labour and material in their making, and though suitable for growth purposes are not so for observing hæmolysis phenomenon owing to the thickness of the agar slopes, except near their upper end. Even then the slopes soon lose their bright red colour in about two or three days' time.

Owing to the difficulties pointed out above, great inconvenience was experienced in routine work in determining the hæmolytic property of fæcal organisms in the course of the examination of the third series of sprue stools.(2) The only way then available for this purpose was to fish the colonies primarily obtained on agar or MacConkey's bile-salt agar on to blood agar plates; the primary isolation of such organisms was obviously out of the question; and even so the work appeared to be disproportionately laborious.

It was during the course of this work and due to the special stress laid by Col. Mackie on the determination of the hæmolytic

*Being a paper read at the Medical and Veterinary Research Section of the Indian Science Congress, Madras, January 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

character of bacteria, that the idea occurred to the author of pouring the blood agar on the ordinary agar slope instead of in the Petri dish to secure a thin uniform layer of the medium. This idea when put in practice succeeded so well that tubed blood agar was found not only to possess all the advantages of the plated blood agar but was capable of being stored and used like the ordinary agar slope.

An ordinary agar slope for being superimposed by a uniform layer of blood agar about 2 mm. in thickness requires about three cubic centimeters of the special medium, while an ordinary plate requires from twelve to fifteen. In the case of the tubed medium, the blood agar sets on an absorbent moisture-bearing agar surface instead of on the dry surface of the plate; this circumstance not only contributes to the medium remaining moist for as long a period as the ordinary agar slope, but also to the retention of the red colour of the medium for over a week if carefully made and stored.

In passing, it may be remarked that the superimposed blood agar slope has facilitated the study of the hæmolytic character of bacteria as greatly as has the author's cotton-wool plug technique in respect of two other protein characters, viz., hydrogen sulphide and indol production.(3) Above all, this simple device of rendering blood agar as readily available as ordinary agar has been instrumental in bringing to light a fact unsuspected so far, that the plague bacillus requires blood or serum for its optimum growth in surface cultures, and has removed the difficulties so long encountered in the isolation, enumeration and identification of the plague bacillus by cultivation methods.(1)

This principle of superimposing could also be applied to other special media, e.g., Soparkar's heated or Goré's (Jr.) digested blood agar medium for the isolation of the influenza bacillus described by Liston,(4) or Alexander Marshall's red blood corpuscle medium for the isolation of the gonococcus and the plasma medium for its subculture.(5)

With respect to the liability of the superimposed blood agar slopes to aerial contamination one cannot expect as great a percentage of sterility as in autoclaved media, since the blood has to be added to the melted agar when the latter is at about 45°C. and the resulting blood agar to be poured into the tubes containing agar slopes. It may be safely remarked here that while in the case of blood agar plates there would be hardly two consecutive plates which would be absolutely sterile, there would not be more than one or two superimposed blood agar slopes that would be found contaminated in a batch of about twenty to thirty tubes.

Having thus given an idea of the principle of superimposition of special media on ordinary agar slopes, a fairly detailed description of 'pouring' the slopes of the modification of Wright's method is given below.

Directions for making Superimposed Blood Agar Slopes.

(1) The required number of ordinary agar slopes are arranged in a cardboard tray. The cotton-wool plugs are loosened and pulled out half way. The mouths of the tubes are flamed so as to render the margins sterile and burn away any cotton sticking thereabout. The slopes are so arranged that they face towards the left of the worker.

(2) Nutrient agar in 50-c.c., 100-c.c. or 200-c.c. quantities filled to about half in appropriate sized lipped flasks are kept ready sterilised in store. When required, the agar is melted by placing the flask in a wire cage contained in a small water bath which is provided with handles. A 100°C. thermometer is inserted in a straight agar tube and placed in the bath. When the agar in the flask has completely melted, the water-bath is bodily removed to a sink and placed under a tap. Water is then run into the bath until its temperature is brought down to about 60°C. The paper cap covering the mouth of the flask is now removed, the cotton plug drawn out, the mouth of the flask flamed, and the plug reinserted half way. The temperature of the bath is now brought to about 45°C. by gently running the tap water again.

(3) Defibrinated rabbit or human blood is used for making blood agar. According to the quantity of the melted agar contained in the flask and the percentage of blood required therein, the calculated quantity of defibrinated blood is taken up in a bulbed pipette, and added to the agar which should be somewhere near 45°C. but not above it. As soon as the blood is added, the flask is lifted out of the wire cage and gently rotated so as to produce a uniform mixture of the blood and agar, care being taken not to allow any frothing.

(4) The flask is then held in the right hand with its plug taken off altogether, and about three cubic centimetres of the blood agar poured into each tube of the agar slopes. The agar tube is held in the left hand between the thumb and the last two fingers and while so held the tube is opened by lifting out the plug by means of the middle and index fingers. After pouring the blood agar into the tube to the height of about one-third the slope from its butt end, the plug is reinserted and the tube handed over to the attendant who puts the tube in a slanting position so that the added blood agar produces a uniform layer on the agar slope. About thirty agars are thus easily poured out of 100 c.c. of blood agar in about five minutes. It is absolutely essential that there should be no draught in the room and all doors and windows should be closed, especially during the time when the blood is added to the agar and the blood agar poured into the slopes. This reduces the chance of aerial contamination to a minimum.

(5) The superimposed layer of blood agar sets in about half an hour's time. The tubes are then taken up one by one, their cotton plugs flamed and properly inserted into the mouths of the tubes. The tubes are replaced in an inverted position in the cardboard tray and incubated at 37°C. for a day. The object of inverting the tubes is to allow any moisture to evaporate and thus provide a dry blood agar surface the next day. If this precaution is neglected the colonies tend to run together and to form a bacterial film which renders the isolation of the individual colonies impossible. In cases where water of condensation is required, the tubes should not be inverted.

(6) After incubation, any contaminated slopes should be discarded, and the sterile slopes stored in the dark. Whenever these slopes have to be used they should be carefully examined with the naked eye as well as by means of a magnifying lens for any stray contaminating colony of a type which is usually quite small, translucent and slow-growing.

Ordinary agar slopes are capable of being used both for the growth of ærobic and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

anærobic organisms, suitable conditions for the latter being secured by Wright's simple technique of chemical anærobiosis.(6) Since the idea of superimposing blood agar on ordinary agar slopes first occurred in connection with the determination of the hæmolytic character of anærobes by Wright's method, it may not be out of place to describe here the modification effected in his technique. In this, the rubber cap or stopper is replaced by a plasticine plug mounted on a piece or glass slide; the plasticine is hollowed out to contain the alkali solution, while the pyrogallic acid crystals are folded in absorbent cotton and inserted in the neck of the tube. This modification is made with the object of sealing the tube prior to making the mixture of alkali and pyrogallol, so that all the oxygen absorbed might be derived entirely from within the tube, as in the case of Buchner's tube. The anærobic condition thus secured has been found to allow the growth of the tetanus bacillus—a strict anærobe.

The Plasticine Plug Technique for Chemical Anærobiosis.

(*a*) Cut off about half of the absorbent cotton-wool plug of the inoculated blood agar tube, and push in the remaining plug into the tube so that it is about one centimetre above the upper end of the slope and about two centimetres below the mouth of the tube.

(*b*) Make a thin layer of absorbent cotton-wool about two centimetres wide, and fold in it two salt-spoonfuls of pyrogallic acid crystals so as to form a round mass, a little wider than the tube, in the mouth of which it is then inserted, so as to remain flush with the margins of the tube.

(*c*) A glass slide is cut into two equal parts and on one of these pieces a lump of plasticine, about the size of a walnut, is so pressed by means of another slide that a circular platform about a centimetre high is obtained; its width should not be more than that of the glass slide. The moistened bottom of a Wassermann test tube is pressed in the centre of the mass of plasticine so as to obtain a hollow to hold about a cubic centimetre of liquid.

(*d*) From a drop bottle a ten per cent. caustic soda solution is dropped into the hollow in the plasticine, so as just to fill it, taking care that none of the solution is allowed to run over the margins of the hollow.

(*e*) Now take up the blood agar tube and press its mouth on the plasticine so that the margins of the tube cut into the plasticine and effectively seal the tube. During this manœuvre the cotton-wool holding the pyrogallic acid crystals comes in contact with the caustic soda solution which very soon penetrates the cotton and commences to act on the crystals. After a minute or two the tube is lifted up in a slanting position and rolled a little so as to allow all the caustic solution to be soaked up by the cotton. The tube is then put back in the inverted position and so placed in the incubator.

It need not be pointed out that the glass slide which is fast stuck to the plasticine plug pressed on it, not only serves as a cover for the plug, but also as a base for the tube to stand erect in an inverted position.

To secure a stricter anærobic condition, the cotton-wool plug of the inoculated tube is taken off altogether and tube kept in a slanting position until it is sealed as described above. Further, after sealing it should always be kept in the inverted position in order that none of the pyrogallol alkali mixture accidentally runs down the tube, since there is no cotton barrier to absorb the overflow if any.

When growth has occurred, the mouth of the tube is drawn out from the plasticine seal, the soiled cotton-wool removed, the mouth of the tube cleaned by dipping it in sterile water and wiped dry with sterile cotton; during all these manœuvres the tube is held in the inverted position. Finally, the tube is replugged with a fresh cotton plug from a sterile tube and handled like an ærobic culture.

SUMMARY

In the tropics tubed media are more serviceable than plated ones, owing to the great liability of the latter to ærial contamination; this susceptibility becomes much greater when the medium contains blood or serum.

Next to nutrient agar, the medium most generally required for surface cultivation is blood agar. Blood agar slopes as ordinarily made are useful for growth purposes only. For the determination of the hæmolytic property of bacteria, blood agar plates are a necessity. However, plated media have to be freshly made and are not amenable to any simple procedure of anærobiosis resembling Wright's.

These drawbacks in the wider routine use of blood agar have been circumvented by the simple device of securing a thin layer of blood agar by pouring it on agar slants instead of into the Petri dish; each slant requires about three cubic centimetres of the medium to provide a layer about two millimetres thick.

The agar slope provides an even, absorbent, moisture-bearing base for the blood agar in place of the uneven, dry glass surface in the Petri dish. In consequence the *superimposed blood agar slope* not only retains the red colour for over a week if properly made and stored, but the blood agar remains available for growth purposes for a much longer period.

The superimposed blood agar slope has placed the isolation of ærobic and anærobic bacteria and the determination of their hæmolytic character within the easy reach of all workers, whether in the field or in well equipped laboratories. Above all, it has been instrumental in bringing to light a fact unsuspected so far, that the plague bacillus is one of those bacteria which require blood or serum for their optimum growth in surface cultivation.

REFERENCES.

(1) Goré (1929). The Isolation, Enumeration and Identification of Plague Bacilli by Cultivation methods; Indian Science Congress.

(2) Mackie, Goré, and Wadia (1928). *Indian Journ. Med. Res.*, XVI, p. 95.

(3) Goré (1925). *Report of the Haffkine Institute*, p. 14.

(4) Liston (1919). *Indian Journ. Med. Res.*, VI, p. 418.

(5) Marshall Alexander (1928). *Journ. Pathol. and Bactl.*, p. 467.

(6) Hall, C. Ivan (1921). Chemical Criteria of Anærobiosis with special reference to methylene blue. *Journ. Bacteriology*, VI, p. 37.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

AVERTIN RECTAL NARCOSIS.

By A. R. PODUVAL, B.A., M.D., C.M.,
Trichur.

THE rectal route for anæsthesia has been long under consideration. The first efforts in this direction were made by F. Roux in 1846. The undeniable advantages of the rectal route, the easiness of administration, the avoidance of choking and excitation, and freedom from complications, opened up the way for further research. Injury to the bowel wall was the great danger in the experiments of Roux and Pirogoff with ether. "Avertin" is an attempt to avoid all these dangers, and ensure a safe and sure anæsthesia.

Chemical Properties.—Avertin, a tri-bromo-ethyl-alcohol, is a white crystalline substance, easily sublimable, with a melting point of 79.8°C., soluble in water at 40°C. to the extent of 3 per cent. It is likely to be decomposed by free exposure to light and air, and hence must be protected and securely kept in tinted bottles. It was first produced by Willstaetter and W. Duisberg by the fermentation of yeast on bromal, but Meerwin and Nord later succeeded in producing it in an easier way. Avertin begins to decompose at about 45°C., producing hydrobromic acid with the formation of dibromacetaldehyde, according to the following formula:

$$C\,Br_3 : CH_2\,OH = H\,Br + C\,Br_2 : CHOH$$
$$= H\,Br + CH\,Br_2 : CHO.$$

This latter is a highly irritating substance producing even in small quantities severe injury to the intestinal mucosa which may go on to necrosis or gangrene.

Pharmacology.—The discovery of the valuable properties of avertin and its introduction into therapeutics are due to the researches of Eichholtz. The pharmacological investigations and the various animal experiments conducted by Prof. Straub, Muenchen, form the basis of the modern use of avertin as a drug for narcosis. He proved that the rectal mucous membrane is capable of taking up avertin quicker than water in which it is dissolved. According to Sevening, the blood concentration of avertin reaches 6 to 9 mgm. per cent. during narcosis.

Excretion.—Avertin is excreted from the system combined with glycuronic acid, and in this form Professor Straub could recover 81 per cent. of the drug from the urine. Very slight traces of bromine are found in the sweat, but no traces of it could be found in the fæces or the expired air.

I do not propose to go into the results of animal experiments done to demonstrate the action and range of the application of avertin. It forms a literature in itself. Lendle fixes its therapeutic range as 1:7. In the modifications of its application, the last word has not yet been said, and experiments are still going on in Germany. But its place as an important anæsthetic has been established beyond a doubt.

My experience with avertin narcosis amounts to over 100 cases in which I myself have administered the drug, and another 500 in which I have seen it used. Every new drug introduced into the armamentarium of the physician and surgeon has to go through the ordeal by fire, and avertin is not lacking in dramatic experiences. I may here state that beyond an occasional "cyanosis" and rarer refractory case, we have not had any unpleasant symptoms, and no deaths attributable to the narcotic itself in our series.

Instead of saturating a patient with a particular form of anæsthetic, say chloroform or ether, from beginning to end, the tendency in Germany to-day is to gradually "lead on to complete narcosis" by stages, "*Zusatz narcose.*" Avertin finds its best application here. Complete surgical anæsthesia with avertin is not advised; though many patients with the prescribed doses do not require any further addition of inhalation narcotic. The great advantage of avertin is that it is given by the rectum, and the patient is saved the unpleasantness of the taste, the smell and the anxiety—the psychic shock—so common in inhalation narcosis.

Procedure.—In the Eppendorf Krankenhaus the patients for avertin narcosis are prepared as follows:—

On the afternoon of the day before the operation, the patient is given a dose of "*bitterwasser*" (sodium sulphate mixture) and 0.5 gramme of veronal at bed time. The next morning the lower bowel is washed out by a copious enema of saline.

The patient is allowed ½ to ¾ litre of tea in the morning if he likes to have it; or if it is indicated on account of the dehydration of tissues. About 1 to 1½ hours before the operation, he is given 1 to 2 c.cm. of pantopon or 1|6 to 1|3 gr. of morphia. In special cases, just before starting the anæsthetic, or during its course we give one ampoule of Raceme ephedrin, Merck, subcutaneously for its effects on the blood-pressure and respiration.

In June 1928 the drug was supplied to us in the solid form, but later we used to receive "Liquid Avertin" (dissolved in amylene hydrate), 1 c.cm. of which contains 1 gramme of avertin. In the clinic of Professor Roedelius, Eppendorf, we were using at that time a dose of 0.15 grm. per kilogram of body-weight, but the manufacturers themselves on the basis of their reports advise a dose of 0.08 to 0.1 grm. per kilo. of body-weight as much safer. The anæsthetic is always given in a separate room, which is preferably kept dark and quiet. The required quantity of avertin is mixed with mucilage of salep, which should be absolutely neutral in reaction, making up a 3 per cent. solution. The drug and the solvent must be vigorously shaken in a glass flask, then placed in a water bath till the solution is at a temperature of 40°C.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Case.—The patient, young, healthy, well built, has a tumour on the right side of the neck in the region of the right lobe of the thyroid. Weight 71 kilograms.

For 71 kilos, we require 71 × 0.15 or 10.65 grms. of avertin. This quantity was mixed up with 426 c.cm. of mucilage, warmed and poured into a glass irrigator, fitted with a rubber tube and glass nozzle. The patient was asked to turn on to his right side, and a rectal tube about a foot long and about the thickness of a little finger after thorough smearing with vaseline was introduced into the rectum for about 8 inches. The rubber tube of the enema was now emptied of its contained air, and the nozzle introduced into the opening of the rectal tube and the whole solution emptied into the rectum by gravity. The enema tube was pressed and squeezed to completely empty it of its contents. A pair of forceps was now clipped on to the rectal tube to prevent the contents flowing out and the patient turned on his face, with the rectal tube *in situ*.

For about ten minutes the patient was talking as usual, but ceased talking rather suddenly. The eyelids seemed very heavy, the conjunctivæ a bit red, just like a man who wants badly to sleep. The nurse now put a piece of folded gauze over the eyes and waited.

There was a slight "cyanosis" of the face, which soon disappeared. There was no struggling, no gasping, no respiratory trouble, or any of the ordinary unpleasant symptoms connected with chloroform or ether narcosis. The patient just appeared to be sleeping, that is all. At this time the reflexes were all present, and the pupils reacted to light. In another five minutes the reflexes became sluggish, then entirely lost, the pupils being well contracted. Pinching of the skin produced no response. At this stage the patient was removed to the operation table.

This was a delightfully favourable case, in which the anæsthesia set in promptly and quickly, and there was no necessity to add chloroform or ether as inhalation. In other cases, I have noticed a slight tendency on the part of the patient to be a bit incoherent during the first few minutes; a later onset of anæsthesia varying from 20 to 30 minutes; decided cyanosis which passes away in about 10 minutes, and more quickly if the lower jaw is kept raised, sometimes a slightly shallow breathing, with increase in the number of respirations, but hardly any effect on the pulse. I remember in the whole of our series one case—a lean elderly man of about 60, suffering from cancer of the stomach, who when taken to the table after the administration of avertin, entirely stopped breathing. An injection of lobeline immediately started regular respirations. The operation was successfully completed (subtotal resection by the Hofmeister-Finsterer-Reichel-Polya method) without the addition of any further narcotic.

Some patients require a slight addition of an inhalation narcotic, such as chlorethyl or ether just before the incision. This is particularly indicated in the upper abdominal region for better relaxation. In any case, the inhalation anæsthetic can be soon withdrawn, and the amount used thus considerably reduced. It is always safer to regulate the dose, keeping to the lower limit of dosage and complete the anæsthesia by a little chlorethyl or ether. Occasionally, a refractory case is encountered and such a patient invariably has a history of alcoholism.

Various other diluents for avertin are used in different clinics. Some use distilled water, others normal saline solution with or without 1|10th its volume of milk, others normosal lotion. These seem to make no difference whatever. In all cases it is necessary to test the reaction of avertin, to be sure that it has not undergone any decomposition and that no hydrobromic acid is present. The temperature of the solution under no circumstances should exceed 40°C.

Test.—Two drops of a 1 in 1000 watery solution of Congo red are added to 5 c.c. of a 3 per cent. avertin solution in distilled water. The solution must now have an orange red colour, *which must not change into blue.* The change of colour into blue denotes the presence of HBr and such solutions ought to be discarded.

Several interesting modifications in the method of administration have been introduced with hardly any noteworthy effects. Goecke gives first a small dose, then increases it drop by drop up to the fixed dose. Borchardt, Grewing, Lobenhoffer, etc. place the patient in the Trendelenberg position to increase the speed of absorption.

Professor Bier of Berlin has latterly added 0.3 grm. of narcophin and 20 c.c. of a 20 per cent. solution of magnesium sulphate to the avertin solution to increase the intensity of narcosis. I have seen only about a dozen cases of this modification in the Eppendorf Krankenhaus, just before I left for India. True, most of them did not require a *zusatz narkotic;* but a few of the patients seemed rather unpleasantly pale on the table, though otherwise there was nothing wrong.

In a few cases, I have noticed the patients trying to lift their lower limbs during the course of the operation and as soon drop them back again. These slight movements do not interfere with the operation at all.

Secondary effects.—Thanks to the several thousands of reports that we have from famous surgeons all over Central Europe, avertin can be dispassionately judged on its own merits. The secondary effects of avertin must be considered in their true light, and its responsibility for producing these effects separated from faulty technique and faulty selection of patients.

1. *Injury to the bowel.*—During the early experiments with avertin, serious injury to the mucous membrane of the bowel was reported, which has since been found to be due to the formation of dibromacetaldehyde by overheating of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

avertin. This is no longer to be feared if we keep within the strict bounds of the directions given (Borchardt, Hirsch, Nordmann, Schmieden, etc.).

2. *Respiration.*—The respiratory centre shows a most decided reaction to avertin. I have already mentioned the "cyanosis" seen at the beginning of anæsthesia, but in some cases patients grow decidedly blue or purple, the colour being noticeable not only on the face and lips, but on the finger nails as well. We do not know why some patients exhibit this phenomenon more than others, probably it is an individual susceptibility of the respiratory centre. In such cases, Professor Straub advises that the remainder of the enema still lying in the ampulla recti may be allowed to flow out. "In every case, after the patient is in a deep sleep, the remainder of the enema may be allowed to run out." This avoids overdosage and shortens the period of after-effects (Eichholtz). To relieve the respiratory distress, raising the lower jaw often suffices; in more protracted cases, the best drugs to use are lobeline, ephedrine or Raceme ephetonin, Merck, or caffeine, which at the same time increases the blood pressure. Heuss, Polano, Sievers, etc., advise the inhalation of carbon dioxide which in avertin narcosis is thought to be superior to every other respiratory stimulant (Borchardt). In the post-operative period, if any slight respiratory troubles are found (I have not noticed any in our series) and mechanical causes can be excluded, the condition can be best relieved by the administration of thyroxin, or grape sugar, (Bender).

3. *Blood-Pressure.*—A fall of blood-pressure as in any other form of narcosis, as well as in physiological sleep, is to be expected with avertin, though in my experience this is not constant. I have, however, noticed cases in which there has been a fall of from 5 to 40 mm. Hg., but generally it rises to the normal in a few minutes, sometimes above the level of blood-pressure noted before the administration of the anæsthetic, (psychic). Decided falls in pressure can be prevented by the injection of suprarenin or ephetonin.

4. *Heart and Blood Vessels.*—The pulse hardly ever shows any alteration in rate or volume. Injury to the heart through avertin could not be proved even by the electro-cardiograph (May and Unger), though such is a common event in chloroform narcosis.

5. *Liver.*—The liver remains unaffected (in contrast to the effect of chloroform on the liver). Reischauer mentions one case of fatty degeneration of the liver with a dosage of 0.15 grm. per kilo. of body-weight.

6. *Kidneys.*—A few cases of albuminuria have been noted by Borchardt, Nordmann, and others; this disappears in a few days. Has reports an undue tendency to venous hæmorrhage after avertin narcosis.

7. *Metabolism.*—As in chloroform, the acid-base equilibrium is shifted to the acid side after large doses.

Duration of anæsthesia.—The usual period of narcosis with avertin varies from 1½ to 2 hours, according to the dosage. In our hospital the remainder of the solution in the rectum is always removed on the table at the close of the operation, and the rectum washed out with normal saline solution. In the post-anæsthetic period a nurse must always be at the side of the patient, to prevent the falling of the lower jaw, which may produce respiratory embarrassment.

The patient awakens as from a sleep, complaining of nothing, and again drops back into a pleasant sleep for 3 to 4 hours, during which he gets over the immediate pain of the operation without any suffering. The great dangers of inhalation narcosis, such as post-operative pneumonia and bronchitis, are considerably reduced. My chief, Professor Roedelius, is in the habit of saying that these are no worse after avertin than after local anæsthesia. Exceptionally, a few cases of restlessness have been reported in the waking period, which is easily controlled by an injection of eukodal, or pantopon.

Indications and Contraindications.—The great advantages of avertin in operations about the head, face and neck, where inhalation anæsthesia is likely to interfere seriously with the comfort of the operator are at once evident. Thus in cleft-palate (Gossmann) in Basedow's disease (Butzenjeiger), in nose and throat operations, etc., it is especially recommended. As a matter of fact, it has been used in almost every case in which inhalation narcosis has hitherto been used.

As contraindications may be mentioned acute and chronic inflammations of the bowel (diarrhœa, dysentery, colitis, etc.), hepatic diseases, severe renal diseases, acidosis, serious diseases of the blood, advanced cachexia, and advanced pulmonary tuberculosis.

As relative contraindications requiring a very cautious dose of avertin may be mentioned the debilitated and the aged, those who are depleted of fluids, and the very obese. In intestinal obstruction and peritonitis, it is safer to give at first a small dose of avertin, to be cautiously increased as may be necessary, as one does not know the extent of damage to the bowel, or its capacity for absorption.

Other uses.—Beyond the domain of general surgery, avertin has been used in obstetrics (Dammerschlaff) and gynæcology, otolaryngology, pediatrics, eclampsia, tetanus, and psychiatry.

Summary.—Avertin must be regarded as a "basal narcotic" and it is always safer to so regulate the dose that the operation can be conducted with a little "*zusatz narkose*" of chlorethyl, ether, or chloroform.

The dosage of 0.15 grm. seems too high. It is better to start with a smaller dose of 0.08 to 0.1 grm. and intensify the anæsthesia when necessary

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

by inhalation. The purity of the drug should always be tested.

The directions for preparation and administration of the solution must be strictly followed to avoid unpleasant effects. A glass syringe of 50 c.c. capacity may well replace the enema apparatus. Avertin should always be given at a temperature between 37° to 40°C. in a 3 per cent. solution. The administration should be conducted in a dark quiet room for preference.

Sagging of the lower jaw should be looked for from the beginning until the awakening of the patient from anæsthesia.

When I joined the "Allgemines Krankenhaus" Eppendrof, Hamburg, in June 1928, Professor Roedelius of the 2nd Surgical Clinic was already performing the majority of his major operations with this anæsthetic, and we had already reports of nearly 600 operations done under avertin narcosis. But in the University Clinics of Germany and in Vienna, avertin was being used extensively; and on inquiry I found that at that time the manufacturers of the drug (I. G. Farbenindustrie, Leverkusen) had accumulated reports of nearly 10,000 cases of avertin narcosis. Up to date January 1929, the number of operations done under this anæsthetic in Central Europe amounts to about 20,000. These facts are important, as they serve to remove several false impressions regarding the discovery and therapeutic application of avertin.

I remember several French, American and English doctors coming to Eppendorf Krankenhaus to learn the technique of avertin narcosis during the latter part of 1928. The methods of using avertin differ slightly in different clinics, and as we had generally uniform success with avertin, some of these doctors seemed very keen on learning the "Eppendorf" methods.

REFERENCES.

Eichholtz (1927). *Deutsche Med. Wochenschrift*, Nr. 17.
Straub (1928). *Muenchenor Med. Wochenschrift*, Nr. 14, 30.
Borchardt (1927). *Deutsche Med. Wochenschrift*, Nr. 22.
Goecke (1928). *Zentralblatt fur Chirurgie*, Nr. 1.
Nordmann (1927). *Zentralblatt fur Chirurgie*, Nr. 17.
Unger und May (1927). *Zentralblatt fur Chirurgie*, Nr. 51.

AN ANALYSIS OF 675 CASES OF PUERPERAL MORBIDITY TREATED IN THE ROTUNDA HOSPITAL, DUBLIN.

By P. C. DUTTA, M.B. (Cal.),
F.R.C.S. (Edin.), D.G.O. (Dub.),
LIEUTENANT, I.M.S.,
Late Post-graduate Student, Rotunda Hospital, Dublin.

FROM January 1921 to June 1927, 11,638 patients were confined in the Rotunda Hospital. According to one of the standards of the British Medical Association, 675 of them were morbid during the puerperium. Only two cases were admitted for treatment of sepsis which were not attended by the hospital. This gives a morbidity rate of 5.8 per cent. during 6½ years.

In the analysis, the cases have been classified into four groups:

(*i*) Where the fever was due to some definite extragenital cause.

(*ii*) Cases in which the fever was due to the retention of the products of conception.

(*iii*) Fever due to obvious puerperal infection, or its duration was more than four days.

(*iv*) Where no definite cause of the fever could be found, and its duration was not more than four days.

Group I.—There were 242 cases belonging to this group. They were—

Mastitis	78
Influenza	52
Constipation	24
Tuberculosis	13
Eclampsia	8
Cystitis	5
Pyelitis	7
Other causes	55
TOTAL	242

So 35.7 per cent. of the total morbidity was due to definite extragenital causes.

Group II.—There were 40 patients who could be included in this group, or 5.3 per cent. Three of them were associated with forceps delivery.

Group III.—167 cases belonged to this group. This included 55 cases of perineal tears, where the perineum itself was the septic focus, and 16 of these were associated with forceps delivery. There were 98 cases of operative delivery in this group in all.

Group IV.—There were 226 cases where no definite cause of the fever could be ascertained. This included 62 cases of perineal tears, 20 of whom were associated with forceps application, where the perineal wound itself was not septic. This shows that aseptic trauma is liable to cause a morbid puerperium. Altogether there were 107 cases of operative delivery in this group.

Analysis of the cases from certain ætiological points.—There were 280 primiparæ, 106 of whom belonged to Group III (definite puerperal sepsis), and 174 to Group IV (fever due to unknown cause). The association of rupture of the perineum in primiparæ and morbidity is remarkable. There were 125 patients with perineal tear in the series under review, and 121 of them were primiparæ.

Exhaustion due to long and tedious labour decidedly predisposes to morbidity. In some cases exhaustion by itself, without any detectable infective lesion has caused a morbid puerperium. In this series, in 106 patients the duration of the first and second stages of labour together were 20 hours or over, and seven of them were fatal, roughly a mortality of 7 per cent. The mortality increases with the length of labour and increase in the acidosis of the blood. Fifty-five of these 106 patients had

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

undergone some form of internal manipulation during delivery and 15 had a lacerated perineum.

In these 106 cases, where the duration of labour was 20 hours or over, the length of puerperal illness was as detailed below:

Number of days ill.	Number of patients.
1 day	9
2 days	36
3 „	20
4 „	13
5 „	6
6 to 8 days	13
9 to 10 „	4
11 to 14 „	2
2 to 3 weeks	3

Some authorities suggest that the duration of the third stage of labour has some effect in causing morbidity during puerperium, but the conclusions that can be drawn from this series of cases do not agree with this. Only in 14 patients was the third stage longer than one hour, and this includes seven cases of operative delivery and one of lacerated perineum. None of them was fatal. The duration of morbidity, where the third stage was more than an hour was as follows:

Number of days ill.	Number of patients.
1 day	5
2 days	2
3 „	2
4 to 10 days	2
10 to 14 „	3

The committee appointed by the obstetrical section of the Royal Society of Medicine to investigate and report on puerperal sepsis observed that albuminuria did not play any part in the causation of infection. During the period under review there were 1,131 patients with albuminuria during labour, and 103 were morbid at puerperium. In other words, 11 per cent. of the patients suffering from albuminuria during labour were morbid, whereas the morbidity rate, taken all round, was 5.8 per cent. only, that is, in patients with albuminuria the morbidity rate was nearly double. Of the above stated 103 cases 22 had undergone operative delivery. Therefore the morbidity rate of patients having albuminuria who had undergone operative delivery was 22 per cent. roughly, whereas the morbidity rate of all the operation cases during the period under review was 17.2 per cent. This definitely shows that albuminuria predisposes to infection.

There were nine cases of puerperal insanity during the period and only one of them had a morbid puerperium, suggesting that, contrary to the usual belief, infection is not the chief cause of puerperal insanity.

An analysis of the morbid cases which underwent operative delivery is presented in a tabular form. The morbidity rate was 17.2 per cent.

TABLE I.

Analysis of the morbid cases which had undergone operative delivery.

Nature of operation.	Total No. of operations done.	No. of cases with morbid puerperium.	Cases Definitely Septic. (Group III.)		Fever due to Unknown Causes. (Group IV.)	
			Number.	Associated conditions.	Number.	Associated conditions.
Forceps	721	113	52	Mastitis, 2. Influenza, 3. Pubiotomy, 5. Manual removal of placenta, 2. Perineal tear, 15. Internal pelvimetry, 2. Induction of labour, 1. Perforation, 1. Eclampsia, 2. Cæsarean section, 1.	61	Pubiotomy, 8. Eclampsia, 1. Internal pelvimetry, 5. Induction of labour, 7.
Manual removal of placenta.	159	30	21	Post-partum hæmorrhage, 2. Internal version, 1.	9	Forceps, 2. Induction of labour, 1.
Pubiotomy ..	25	13	8	Forceps, 8.	5	Forceps, 5.
Cæsarean section ..	98	41	24	Forceps, 1. Internal pelvimetry, 2. Forceps, 7. Cæsarean section, 2. Perforation, 1. Prolapse of cord, 1. Internal pelvimetry, 1.	17	Nil
Induction of labour	147	17	14		3	Forceps, 1. Manual removal of placenta, 1.
Internal version ..	151	7	2	Manual removal of placenta, 1.	5	Nil
Craniotomy ..	21	7	5	Nil	2	Forceps, 1.
Internal pelvimetry	(Not recorded).	9	7	Forceps, 4. Cæsarean section, 1. Induction of labour, 1.	2	Forceps, 2.
Decapitation ..	..	4	4	Eclampsia, 1.	Nil	Nil
Lacerated perineum	..	125	66	Forceps, 21.	59	Forceps, 15.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

There were 25 cases of malpresentation in this series; 11 of them underwent internal manipulations during delivery.

Cæsarean section was done in 98 cases; forty-one of them were morbid during the puerperium. The classical operation was carried out in 90, and 8 had the lower segment operation. In both the series the average duration of morbidity was seven days. Four cases ended fatally, and in all of them the classical operation was done.

There were 4 cases of accidental hæmorrhage, 12 of placenta prævia and 15 of post-partum hæmorrhage. In 13 of these hæmorrhage cases internal manipulations had been done.

Fatal Cases.—There were 24 deaths among 675 patients who were morbid, a mortality of 3.5 per cent. due to sepsis. In 7 of them no internal manipulation was done during delivery, and the labour was easy and normal. As already stated, there were 4 cases of Cæsarean section, and all had the classical operation done; one of them died from intestinal obstruction and three from general peritonitis. In one patient Cæsarean section was done at the end of trial labour and the baby was dead. In the second it was done 26 hours after rupture of the membranes, and in the third after failing to deliver with the forceps.

Blood culture was done in eight of the cases which ended fatally and 5 of them yielded *Streptococcus hæmolyticus*. Culture from uterine swabs was done in 12 of these cases, and all yielded some form of growth except one. Nine yielded *Streptococcus hæmolyticus*, one *B. coli* and one a mixed growth of both. One patient died from gas gangrene infection (*B. welchi*). Among the operation cases which ended fatally, there were 4 of forceps delivery, 4 of perforation and decapitation, 4 of manual removal of placenta, one of pubiotomy, one of induction of labour with stomach tube and one of rupture of the uterus.

TREATMENT.

Prophylactic.—Antistreptococcal serum was used for preventive purposes in 33 cases: 13 of them had a morbid puerperium including 4 deaths.

Puerperal antitoxic serum. This was specially supplied for experimental purposes. As the name implies it is an antitoxic serum and not antibacterial. It was used in 6 desperate cases and so far as can be judged from these few, the effect was very good.

CASES.

Case 1.—Perforation and embryotomy was done, followed by hysterectomy for rupture of the uterus. On the first evening she had a temperature of 100°F. and pulse rate 100, and was given the serum (20 c.c.). The patient was not morbid according to the standard laid down by the British Medical Association.

Case 2.—Neglected shoulder presentation causing rupture of the uterus: decapitation was done, and the uterus plugged with gauze. She was admitted in a very poor condition and submammary and intravenous saline were given. Then 20 c.c. of the antitoxic serum was injected. The puerperium was stormy from the third to sixteenth days. The plug was removed on the eighth day. Highest pulse and temperature were 130° and 104.6F., respectively, on the fifteenth day. Blood culture—sterile. There was parametritis and it drained through a rent in the uterus. The patient recovered ultimately.

Case 3.—First pregnancy, forceps delivery after 26 hours' labour. 20 c.c. of the antitoxic serum after delivery. Morbid for four days.

Case 4.—The patient had a rise of temperature before delivery. Craniotomy was done after 15 hours' labour. Prophylactic antitoxic serum 8 c.c. Morbid for 4 days only.

Case 5.—Second pregnancy. Too many vaginal examinations had been done outside. Prophylactic antitoxic serum 10 c.c. Morbid for 2 days.

Case 6.—Classical Cæsarean section late in labour. After operation the mother had 10 c.c. of the serum. She got 20 c.c. of collosol iodine on the third day. Later developed symptoms of intestinal obstruction; the abdomen was opened but the patient died ultimately.

Iodine.—Collosol iodine, given intravenously in 20 c.c. doses, has a fairly good effect as a prophylactic. How it acts is not definitely known. In the proportion it circulates in the blood it cannot be strong enough to act as an antiseptic. Moreover at this stage there are hardly any organisms in the blood. Organisms grow abundantly in a medium containing a far greater proportion of iodine than would be in the blood when 20 c.c. of collosol iodine is given intravenously. It does not produce any leucocytosis in the blood, nor does it increase the phagocytic power of the individual leucocyte. It may be said that iodine by stimulating the thyroid gland increases the metabolic rate and thereby enhances the patient's resistance against bacteria; and this can be produced more easily and effectively before the patient is really ill.

Curative.—In 1921, six patients were treated with intravenous injections of eusol, novarsenobillon and sodium bicarbonate. Three of them died.

Vaccines were used in six cases, with one death.

Antistreptococcal serum was used in 10 cases. In four of them the temperature came down on the day when the injection was given. There was only one death.

Antiscarlatina serum was used in five cases, and in all of them the uterine culture was positive. Two of them yielded a mixed growth of streptococci and staphylococci, two *Streptococcus hæmolyticus* alone and one staphylococcus alone. There was no death.

Collosol iodine was used from March 1925, and 78 patients were treated with it in this series. There were three deaths, including one from intestinal obstruction following Cæsarean section. So the mortality of the cases treated with iodine is about 2.5 per cent., whereas in the rest, i.e., 597 cases, who were not treated with iodine there were 21 deaths, the mortality being 3.5 per cent. roughly. The administration of collosol iodine does not appear to shorten the average period of morbidity, as compared with the series of cases who had no iodine treatment. From the analysis of these cases it does not appear that iodine has any specially beneficial effect when a case is already septic, but if administered early it certainly

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

does good, and to get the full benefit of the drug it should be given as early as possible.

SUMMARY.

1. The morbidity rate during the period under review was 5.8 per cent. The morbidity of the operation cases was 17.2 per cent. Only in 32 per cent. of all the morbid cases was the morbidity due to a detectable focus of puerperal infection.

2. Exhaustion from long labour predisposes to infection, probably by causing an acidosis in the system. Albuminuria also predisposes to sepsis.

3. There were 24 deaths from sepsis among 11,638 patients confined, of whom 675 were morbid.

4. Collosol iodine given early is useful.

5. Puerperal antitoxic serum appears to have a good effect as a prophylactic in cases where the puerperium is likely to be septic.

I beg to thank Dr. Bethel Solomons, Master of the Rotunda Hospital, for the facilities he afforded me while working there.

(*Note.*—Before publishing the above paper, we decided to refer it to the Master of the Rotunda Hospital, Dublin, Dr. Bethel Solomons. In reply Dr. Solomons writes that he consents to publication, but would point out that the statistics ranged over the end of one Mastership and the beginning of another, so that there was not uniformity of treatment. Also the Cæsarian section results quoted were before the popularity of the lower segment operation. Much of the matter dealt with will be found in the Rotunda Hospital reports.—EDITOR, *I. M. G.*)

LEPROUS REACTION.

By JOHN LOWE, M.B., Ch.B.,
Medical Officer, Leprosy Hospital, Dichpali, N. G. S. Railways.

LEPROSY is usually a chronic disease but at certain stages there may be acute exacerbations which are usually temporary, passing off after a few days or weeks. These acute exacerbations are what are known as leprous reaction or leprotic fever. This phenomenon is well known to leprologists. Leprous reaction is of great importance and calls for further study. The following is an account of observations of leprous reaction made during the treatment of several hundred cases of leprosy.

Type of case in which leprous reaction is seen.

Generally speaking the greater the number of *Mycobacteria lepræ* there in the system, the greater is the tendency to leprous reaction. Reaction is rarely seen in the early case of nerve leprosy, but the passage from the A1 stage to the B1 stage may be marked by leprous reaction. During the B stages of skin leprosy, reaction is much more commonly seen, but as the A2 stage is approached, reaction becomes more and more rare.

Clinical signs of reaction.

One of the most striking things about leprous reaction is the amazing variety of the clinical manifestations. The commonest of these manifestations are here enumerated and briefly described. Many of these may be present in one patient, and in other patients only one or two of these manifestations may be found clinically.

(*a*) *General.*—Fever, malaise, sleeplessness, pains in nerves and in joints.

(*b*) *Lesions of the skin.*—These are, first, an inflammation of the previously existing skin lesions and, second, the appearance of new skin lesions. The old lesions, nodules and thickenings become inflamed, erythematous and swollen. Suppuration and ulceration of the skin lesions is sometimes seen. The new lesions may take many forms. The commonest is the small round erythematous lesion situated in the deeper layers of the skin. These may be very numerous and scattered all over the body, but are most commonly seen on the extensor surfaces and on exposed parts. Another common form is the slightly thickened erythematous border to a depigmented patch. Erythematous macules with definite borders, and diffuse erythema with slight thickening of the skin are sometimes seen. Rarer skin lesions are papules and pustules. Sometimes the reactionary lesions are not visible and can only be detected by deep palpation as they are situated in the very deep layers of the skin. These subcutaneous reactionary lesions may take the form of discrete nodular thickenings, or there may be diffuse thickening of the skin and subcutaneous tissue giving an appearance and feel like scleroderma. A recent case of leprous reaction showed no lesions in the skin but the subcutaneous tissues of the arms and legs were thickened, hard and painful.

(*c*) *Lesions of nerves.*—Commonly there is acute inflammation of nerves, especially the ulnar nerve. A nerve which was previously only slightly thickened may swell up as thick as a finger. This may give rise to excruciating pain. Frequently there is an increase in anæsthesia in the distribution of the affected nerve. Sometimes nerve reaction gives rise to nerve abscess.

(*d*) *Lesions of the nose.*—There is frequently an increase in the nasal symptoms. Nodules may swell and ulcerate and epistaxis is common. Frequently the nose may be completely blocked by swelling and ulceration of the lesions and by the discharge.

(*e*) *Lesions of the eye.*—Irido-cyclitis is very commonly seen.

(*f*) *Lesions of the larynx.*—If nodulation is present in the larynx, reaction sometimes causes swelling of the nodules and respiratory obstruction, and tracheotomy may be necessary.

(*g*) *Lesions of the internal organs* are not common in leprosy, but when they do occur they are nearly always associated with leprous reaction.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The lungs.—In one recent case the lungs were affected with what was apparently a leprous broncho-pneumonia. Large numbers of acid-fast bacilli were found in the sputum, the temperature rose to 104°F., respiration was very rapid, and there was patchy consolidation of the lungs. This was associated with reactionary lesions in the skin and in the nerves. The whole condition cleared up in about three weeks.

The testis.—Leprous orchitis is commonly seen in leprous reaction.

The liver.—An acute leprous hepatitis is occasionally seen. A recent case had leprous reactionary lesions in the skin associated with extreme tenderness and enlargement of the liver, which extended down to within two inches of the umbilicus. As the reaction subsided the liver enlargement disappeared. There was no jaundice.

The spleen.—Tenderness and enlargement of the spleen have been seen in one or two cases of leprous reaction.

The kidneys.—The kidneys may be affected, causing an acute leprous nephritis with general œdema and suppression of urine. The signs may be the same as those found in other forms of acute nephritis. Leprosy bacilli are often found in the urine. Death may occur or the nephritis may disappear with the subsidence of the reaction.

(*h*) *Lesions of joints.*—Joint pains are very common in leprous reaction and are caused by an acute arthritis. Frequently there is effusion of serous fluid into the joint, particularly in the knee. As the reaction subsides, the fluid becomes absorbed, but if reactions are severe and repeated, adhesions and limitation of movement may result.

Pathological examination of leprous reactionary lesions.

Unfortunately we have only been able to examine a few reactionary skin lesions removed by biopsy. The changes found are those usually seen in the leprous skin but in addition there are often small areas of hæmorrhage and there may be much invasion by polymorphonuclear leucocytes. Epithelioid lepra cells are usually numerous and some of them may contain lepra bacilli, but generally speaking lepra bacilli are comparatively few in number and many of them are short or beaded and do not show the ordinary bacillary form.

Blood examination in leprous reaction.

The blood shows nothing very characteristic. The red cells are usually about normal in number, though there may be some anæmia. The white cells are usually increased to about 12 to 15 thousand per cubic millimetre but there is no marked increase in any one particular cell. Usually the lymphocytes are in slightly greater proportion than normal. When suppuration occurs as the result of leprous reaction, there is an increase in the white cells up to 25 or 30 thousand and the polymorphonuclears are particularly affected.

In some severe cases of leprous reaction lepra bacilli may be found in the blood by Crow's technique.

The rate of sedimentation of the blood corpuscles is increased in leprosy, especially in the B2-B3 stages, but in leprous reaction a still further increase in the sedimentation rate occurs, the increase being roughly proportional to the severity of the reaction.

Conditions associated with the onset of reaction.

In some cases leprous reaction occurs without any apparent exciting cause. In many cases, however, careful investigation will reveal some condition which apparently has an influence in bringing on the reaction. Generally speaking anything which tends to lower the patient's resistance may act in this way. The commonest of these factors may be summarised as follows:—

(*a*) *Habits and diet.*—Reaction is rare among patients who lead active healthy lives and eat good food. It is much more common among those leading sedentary lives and taking a poor diet. Semi-starvation in destitute lepers is also a common cause of reaction. An interesting observation recently made is that during the season of *Ramzan* when Mohammedans should not eat or drink anything between sunrise or sunset, leprous reaction has been frequently seen in Mohammedan patients. They have observed their religious rule and as this season in India is very hot this observation has frequently caused much suffering. At night instead of sleeping they have been eating and drinking, and at the end of a month of this trying regime with its absence of rest, leprous reaction has occurred.

(*b*) *Intercurrent disease.*—During the rainy season, when malaria is prevalent, malaria is commonly associated with leprous reaction. So common has it been that in every case of leprous reaction seen at the rainy season, we have examined the blood and have found malarial parasites in many cases. Other intercurrent diseases acting in the similar way are syphilis, smallpox, typhoid, influenza, etc. Pregnancy and confinement may cause leprous reaction. Recently all the patients in our institution have been vaccinated against smallpox and several have had a reaction as a result.

(*c*) *Treatment.*—Most of the various forms of leprosy treatment at present in use show some tendency to produce leprous reaction. This tendency is most marked in the potassium iodide treatment, which has as its basis the principle that mild leprous reaction may be beneficial. Treatment by thyroid extract which has now been reintroduced also shows a fairly marked tendency to produce leprous reaction. The hydnocarpus preparations occasionally produce leprous reaction but this tendency is not marked. The heavy metals and their salts, if given in large doses in leprosy, frequently cause action.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The nature of leprosy reaction.

From a study of clinical manifestations leprous reaction appears to be a toxæmia which is associated with liberation of lepra bacilli and their dissemination throughout the body.

The bacilli.—These may be the result of the multiplication of the bacilli in the body or else they may be bacilli which have previously been shut up in lepra cells and which are liberated during reaction. In either case the predisposing causes previously mentioned seem to initiate the process of either multiplication or liberation of lepra bacilli. Exactly which process occurs and how it is brought about we do not know.

The toxæmia.—There are three possible sources from which the toxin may originate. First they may be exo-toxins produced by the lepra bacilli, but lepra bacilli normally show practically no toxin production. The leper patient may have his whole body teeming with lepra bacilli, yet if he is not in the reactionary phase he will show no toxæmia. Are we therefore to conclude that lepra bacilli normally produce no toxin, but in reaction toxin is produced? The second possible origin of the toxin is by the destruction of the lepra bacilli in leprous reaction with the liberation of endo-toxins. There is some evidence that lepra bacilli are destroyed in leprous reaction. In reactionary lesions the bacilli often show short beaded or spore-like forms, but we have no proof that these are dead or degenerated bacilli.

A third possible origin of the toxin may be explained as follows:—The toxin may be the result of the union of an antigen (lepra bacillus) with the immune body or amboceptor produced by the defensive mechanism of the tissues. In other words, leprous reaction may be an allergic phenomenon produced as the result of the sensitizing of the tissues to the lepra bacillus. If this is so, the toxins are not produced directly by the lepra bacillus but indirectly, the liberation of the lepra bacilli into the blood-stream acting as the exciting cause. There is some evidence that such sensitization does occur. In potassium iodide treatment, probably from the breaking down of lepra cells, lepra bacilli are liberated, the number of lepra bacilli liberated being roughly proportional to the dose of potassium iodide given. Cases are frequently seen in whom before sensitization 240 grains of potassium iodide can be given without causing reaction, but after sensitization even small doses cause reaction.

Of these three possible sources of toxin, probably the third is the most important, and leprous reaction is probably an allergic phenomenon.

The results of leprous reaction.

All leprosy workers are agreed that severe reactions are usually harmful as they have a marked weakening effect upon the patient. Concerning the result of mild reactions various authorities have expressed different opinions. The Philippine workers consider that even mild reactions are often harmful and are to be avoided. On the other hand, Muir considers that in some cases mild reaction is beneficial and he induces mild reaction by carefully regulated doses of potassium iodide. He considers that reactionary lesions are usually temporary and the subsidence of reaction is often accompanied by diminution in the infection. After treating about 200 patients with potassium iodide by Muir's technique I have formed the opinion that reactionary skin lesions are usually temporary, but reactionary nerve lesions and their results are often permanent. In addition reaction always has a bad effect on the general condition of the patient. In some cases reaction is followed by a diminution of the lesions, but I do not think that the proportion of patients in whom this occurs is sufficiently great to justify the use of potassium iodide as a general treatment for leprosy. I believe that of the remedies at present in use for leprosy, the best are those which show the least tendency to produce leprous reaction, that is the hydnocarpus preparations, of which I prefer the ethyl ester.

The importance of reaction in the spread of leprosy.

It has been suggested that the period of reaction is a period of high infectivity and two possible causes of this are as follows. First, an infective case certainly discharges more bacilli from the body during the reactionary phase than during the quiescent phase. Increase in nasal discharge, suppuration of nodules, etc., increases the infectivity of the patient. Secondly, it has been suggested that the bacilli in the reactionary phase are more virulent. Definite proof of this is not available, but it is possibly so. A leprosy worker has suggested that attempts to cultivate the leprosy bacilli might be successful if the material for culture were taken from a patient in the reactionary phase.

Treatment of leprous reaction.

Slight reaction usually passes off in a few days without treatment. The more severe leprous reactions need careful treatment. The patient should be kept in bed and given light diet as long as fever continues. Plenty of fluid should be taken. As reaction is often associated with constipation a good purge should be given. Intravenous injection of 0.02 of a gram of potassium antimony tartrate in 1 c.c. normal saline should be repeated every other day. If the reactionary skin lesions do not subside fairly quickly they should be painted with trichloracetic acid, 1 in 2 or 1 in 3 parts of water. Severe neuritis may be relieved by injections of adrenalin 3 minims of 1 in 1000 solution, or by oral administration of ephedrine 6 grains. These measures relieve the pain for a time, but if neuritis is very severe and persistent and there is much swelling of the nerve, then in such cases the nerves should be exposed by operation and the sheath incised and stripped off the nerve for the whole area of thickening. This stops the pain in nearly every case. Irido-cyclitis should be watched for and treated by atropine, hot fomentations and weak

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

antiseptic solutions and the eye should be kept covered. Nasal lesions should be treated by irrigating with warm weak antiseptic solution. By these means reactions can usually be controlled and cut short and most of the reactionary lesions will disappear. Sometimes, however, reactionary nerve lesions are persistent. The effect of potassium antimony tartrate on leprous reaction is often most marked, but if a patient gets repeated reactions treatment with potassium antimony tartrate the drug seems to lose its efficacy.

In addition to treating the reaction, treatment of any predisposing cause to reaction, e.g., malaria, syphilis, etc., is most important.

[*Note.*—We have shown the above article to Dr. Muir, who comments on it as follows:—

(1) During leprous reaction the bacilli may be diminished in number, but it is quite common to find very large masses of bacilli still persisting. If the bacilli have been few in number before the reaction they will be found few in number during the reaction.

(2) It is not uncommon to find 25 or 30 thousand leucocytes, even without suppuration.—EDITOR, *I. M. G.*]

PERTHE'S DISEASE.

By NISANATH GHOSH, M.B.,
Teacher, Berry-White Medical School, Dibrugarh, Assam.

PERTHE'S disease is a disease with about half a dozen synonyms viz.:—pseudo-coxalgia, coxaplana, osteo-chondritis deformans, Legg's disease, Perthe's or Calve's disease, quiet hip disease, etc.

In spite of its numerous names it is not very well known to the general practitioner in this part of India at least. On the other hand, it eludes detection by the average doctor, just as a veteran criminal with half a dozen names and surnames throws dust into the eyes of the average policeman.

To escape from such pitfalls in diagnosis we must know what it is, what are its chief features and what other diseases it resembles.

Perthe's disease belongs to the osteo-chondritic group which has come into prominence since radiology has come into existence. It affects the hip joint of young children at almost the same age as does tuberculous disease. It commences in the epiphysis. There may be a history—perhaps indefinite—of injury, usually trifling. The trouble complained of is often slight limping, as in early cases of tuberculous hip disease. Slight limitation of movement may also be seen. Thus in many respects it may resemble tuberculous disease of the hip joint in children.

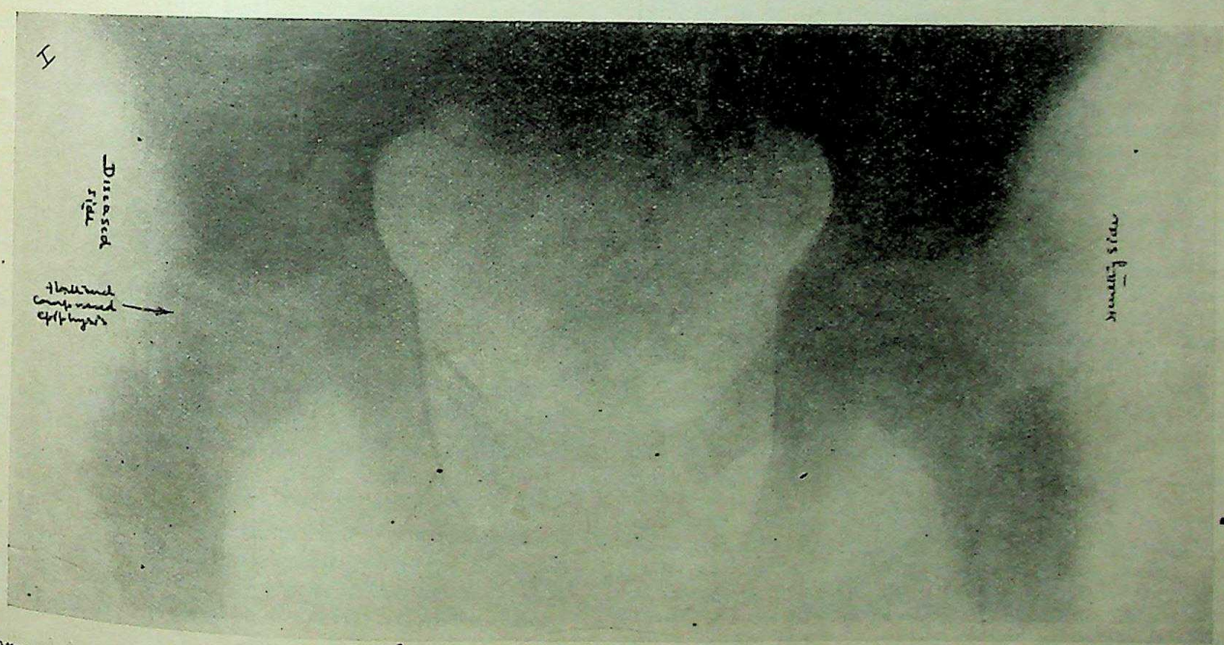
But prognostically, pathologically and radiologically it is quite different from tuberculous disease.

The prognosis, unlike that in tuberculous disease, is good. Recovery is the rule.

The chief pathological changes are as follows:—

The bone cells in the bony nucleus of the epiphysis become dead or decalcified. So the epiphysis gets flattened, owing to pressure exerted on it by the body-weight of the patient. Later on repair takes place and new bone is deposited in the deformed epiphysis. This deformed head of the femur does not fit into the acetabulum and osteo-arthritic changes may follow.

Unlike tuberculous disease, Perthe's disease never leads to suppuration and never gives rise to serious constitutional symptoms.



RADIOGRAPHIC FINDINGS.

The views about the pathology of Perthe's disease are mainly based on radiographic findings.

The radiogram of an affected joint does not present the same foggy or ground-glass-like appearance of tuberculous hip disease. In the early stage the bony nucleus of the epiphysis shows irregular density and the epiphysis itself

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is compressed. Later on the epiphysis looks dense, flattened and fragmented (never hemispherical). There may be widening of the femoral neck and irregularity of the upper lip of the acetabulum.

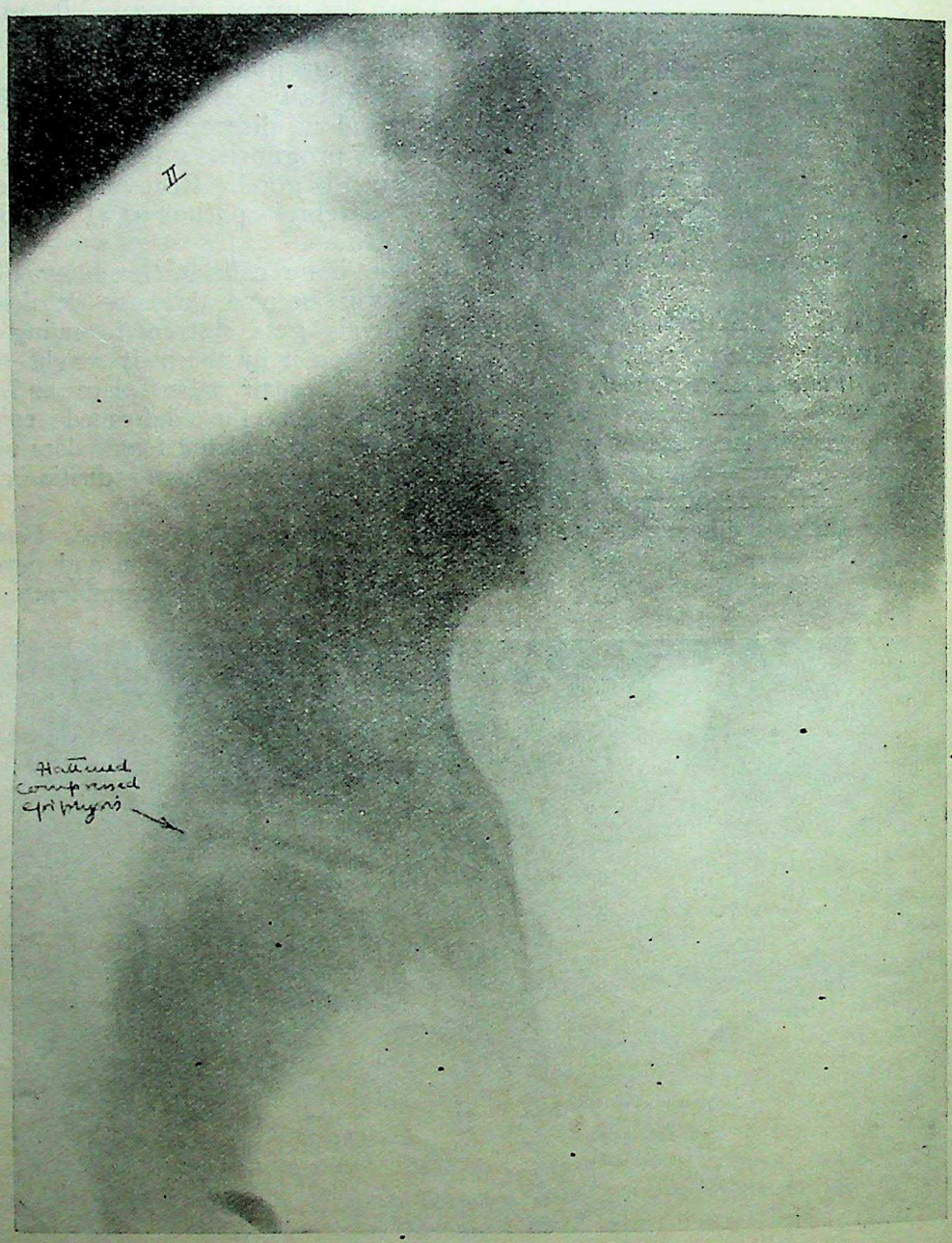
DIAGNOSIS.

Errors in the diagnosis of this disease are often due to one or more of the following causes:—

(*i*) It resembles tuberculous hip disease in many respects, as well as a displaced femoral epiphysis.

children the possibility of Perthe's dsease should never be lost sight of, as will be seen from the case noted below:—.

Case.—On the 31st March, 1928, a boy of about ten years of age was brought to me for *x*-ray examination of the left hip joint, on the suspicion of tuberculous disease. He had a slightly limping gait for the last one and half years or so. The thigh on the affected side was a bit wasted—perhaps due to limited use. The general health was quite good and there was no constitutional disturbance. The facts which should have attracted the attention of every clinician in this case are:—a disease of one and a half year's duration with no other local troubles but trifling pain and a limping gait without



(*ii*) The possibility of its occurrence is often forgotten, though it is not an unusually rare disease.

(*iii*) A certain diagnosis of Perthe's disease is impossible without radiography.

Of these three the second one is very important as it escapes our attention so often. In the diagnosis of all cases of hip joint troubles in

any change in the length of the limb, without deformity, limitation of movement, abscess formation, enlargement of the iliac glands, etc., and also without any constitutional symptoms or impairment of the general health.

All the negative findings mentioned above, together with the radiographic appearances to be described and shown presently, excluded the possibility of tuberculous disease as well as of a displaced epiphysis.

X-ray examination in this case showed a dense, flattened and compressed epiphysis of the head of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

femur on the affected side (*vide* the skiagrams herewith reproduced).

Major Hepworth, I.M.S., etc., Superintendent of the X-Ray Institute of India, Dehra Dun, to whom a radiogram of this case was sent for favour of his opinion, remarks as follows:—

"I think there can be little doubt that the film you send for my opinion is of a case of Perthe's disease. I shall be much obliged if you will send me a film of this case good enough to reduce for a lantern slide. I have no example of this disease for demonstration purposes."

The above-mentioned remarks from an eminent radiologist not only confirm the diagnosis but testify to the comparative rarity of the disease as well.

Before concluding it may not be out of place to touch upon the etiology and treatment of this disease.

Etiology. This is not definitely known. The generally accepted theory is that a trifling and often unnoticed injury causes a defective blood supply, leading to decalcification and partial absorption of the bony nucleus of the cartilaginous epiphysis of the head of the femur. Owing to loss of bone and calcium (partial or complete), the cartilage gets flattened from the superimposed body-weight. Later on repair takes place, the blood supply is restored, and irregular bone and calcium deposit occurs in the already deformed epiphysis.

Treatment. The affected limb is to be kept free from the body-weight by some contrivance, and if there is much pain rest in bed may be necessary. Briefly these are the lines to be followed.

REFERENCES.

(1) George Perkins. Treatment of Pseudo-Coxalgia. *Lancet*, 1926.
(2) Muir. *Practical X-Ray Work.*

ISOLATION OF THE ANTINEURITIC VITAMIN.

By ASHUTOSH MUKHERJI,
Research Worker, Chemical Laboratory, Presidency College, Calcutta.

IN their paper, "Isolation of the anti-beriberi vitamin," Jansen and Donath(1) have isolated the antineuritic vitamin from rice polishings using 20 per cent. acid alcohol as the extracting fluid and relying on the selective adsorption on Fuller's earth for the initial separation of the antineuritic vitamin from a large quantity of inactive material. The vitamin after liberation with baryta was further purified by the silver fractionation method of Kossel and Kutscher(2), followed by precipitation with phosphotungstic acid and platinic chloride and final alcohol-acetone fractionation.

In the present investigation we have been successful in obtaining a solid crystalline antineuritic residue from rice polishings, following more or less the method outlined by Jansen and Donath up to the platinum purification, thus confirming their results. The final alcohol-acetone fractionation has been avoided in the present investigation, and the method successfully modified by repeating the platinum purification followed by crystallisation from water.

In all investigations attempting the isolation of vitamin B, by Funk and his collaborators(3) down to Jansen and Donath, dilute alcohol has been used to extract the vitamin. Although it is known that the antineuritic vitamin is readily soluble in water, it is remarkable that no one should have attempted to extract the vitamin by means of acid water, particularly so when we peruse the most notable work of Osborne and Wakeman(4) in which they attempted to concentrate the vitamin from yeast by means of boiling water. Jansen of course used the alcohol not to act as a solvent, but to counteract the influence of micro-organisms.

Technique.

It has therefore now been attempted to modify Jansen's technique by using acid water instead of dilute acid alcohol for the initial extraction of the vitamin from the rice polishings, using substances cheaper than alcohol for preservative purposes, thus considerably reducing the working cost. On the laboratory scale, where arrangements cannot be made for the recovery of alcohol from large volumes of water, the cost of the large volume of alcohol that is necessary must be an important consideration.

With this end in view 100 kgms. of fresh rice polishings (in two lots of 50 kgms. each) from the local rice mills have now been extracted with water containing 0.25 per cent. of sulphuric acid and saturated with thymol by adding the requisite quantity of an alcoholic solution of thymol aided by vigorous stirring. A little quantity of toluene and a few drops of chloroform were also frequently used to prevent the growth of moulds.

The rice polishings were washed in wooden casks on a countercurrent principle after the fashion of Jansen for about four days, after which the pH of the resulting liquor was adjusted to 4. One kgm. of "acid clay" was then added for every 30 kgms. of the rice polishings, and after a vigorous stirring for about a day the liquor was decanted and the vitamin liberated from the acid clay by means of baryta. The filtrate was then quickly acidified with sulphuric acid till an acid concentration of 5 per cent. was reached, after which all bases were precipitated with a solution of phosphotungstic acid in 5 per cent. H_2SO_4. The vitamin was again liberated from the phosphotungstate by means of baryta, and after acidifying with H_2SO_4, an excess of silver nitrate was added. The resulting precipitate was filtered off and the pH of the filtrate was slowly raised by the addition of baryta solution. The precipitate that formed between the limits pH 4.5 and pH 6 was filtered and decomposed by dilute HCl, and the filtrate from the silver chloride after decolorisation with "Norite" (the propietary vegetable charcoal used by Jansen) was evaporated to dryness *in vacuo* over quicklime.

The residue left weighed about 3 gms. from 100 kgms. of the rice polishings. Jansen by using dilute acid alcohol obtained at this stage 5 gms. from 100 kgms. of rice polishings.

The feeding experiments were also conducted at this stage on *munnia* birds exactly after Jansen's method

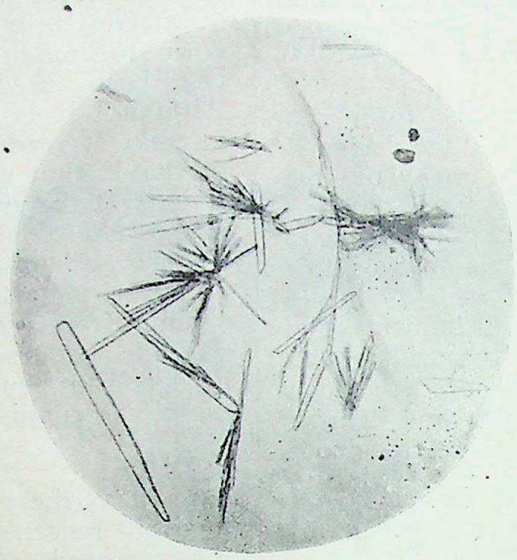
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and it was found that at a dosage of 30 mgms. per bird per day the birds were protected from polyneuritis, whereas the controls that were fed on a diet free from vitamin died between the seventh and the eleventh day.

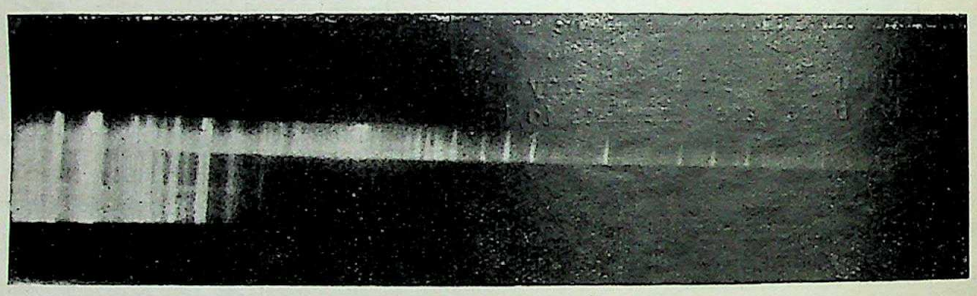
The residue, after being thoroughly dried (in which process it loses much of its treacly nature and becomes a hygroscopic powder), is extracted in absolutely anhydrous alcohol and the platinum double salt is precipitated by means of an alcoholic solution of platinic chloride. The platinum precipitate is then filtered, washed with dry absolute alcohol, suspended in water and decomposed with H_2S. The solution after filtering off the platinum sulphide, is evaporated to dryness *in vacuo* over quicklime. The platinum purification is then repeated. After repeating the process once again, the vitamin can be obtained in a crystalline form by the slow evaporation of its aqueous solution. The crystalline shape of the vitamin as thus obtained is seen to be absolutely identical with that obtained by Jansen and is shown in the accompanying photomicrograph.

The absorption spectrum of the vitamin solution has also been taken, using the copper arc as the source of light, and it is found that there is a marked absorption in the region 3900 oA to 3300 oA and all rays shorter than 3248 are also absorbed. The doublet 3248 and 3274 of the copper arc, however, show quite vividly as is seen from the lower photograph. Whether the above absorption bands are characteristic of the antineuritic vitamin cannot be settled at present before we prepare the vitamin crystals from sources other than rice polishings and succeed in getting the same absorption spectrum.



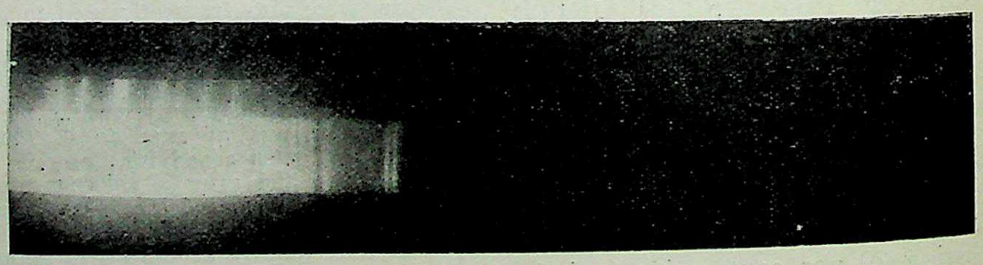
No. 1.
Photomicrograph of the crystals of the antineuritic vitamin.

(1)
(2)
(3)



No. 2.

(4)



No. 3.
Spectrograph of the vitamin solution.
(1) The copper arc.
(2) & (3) Same arc through the vitamin solution.
(4) Longer exposure.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

My best thanks are due to Lt.-Col. H. W. Acton, I.M.S., Director, School of Tropical Medicine, Calcutta, and also to Dr. S. Ghosh, D.Sc., for their kind suggestions in connection with this work.

Conclusions.

(1) Jansen's results have been confirmed.

(2) The method of isolating the anti-neuritic vitamin has been modified by using acid water in place of acid alcohol.

(3) Thymol has been found to be satisfactory in preventing the growth of moulds.

(4) The yield when acid water is used is comparable to that obtained by dilute alcohol.

(5) A preliminary study has been made of the absorption spectrum of the vitamin solution.

REFERENCES.

(1) Jansen and Donath. *Mededeelingen Van den Dienst der Volksgezondheid in Nederlandsch-Indië*, 1927, 1, 186.

(2) Kossel and Kutscher. *Zeitschr. f. Physiol. Chem.*, 31, 165 (1900).

(3) Funk, C. *Journ. Physiol.*, 43, 395 (1911) and 46, 173 (1913).

(4) Osborne and Wakeman. *Journ. Biol. Chem.*, XL, 383.

UNUSUAL DISPLACEMENTS OF THE EPIPHYSIS OF THE PATELLA.

By J. H. BARRETT, D.M.R.E.,
CAPTAIN, I.M.S.,
Quetta.

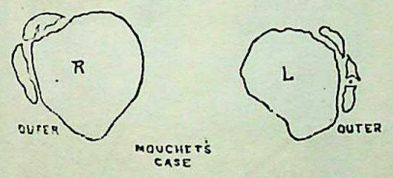
THE striking point about these two cases is not so much the fact that the actual ossifications were of extreme rarity, as the fact that these rare ossifications showed definite displacement. My object in placing these cases on record is on account of (*a*) the possibility of the true nature of the case being missed, (*b*) the evaluation of the patient's story as to when he sustained an injury may be verified radiographically, (*c*) the medico-legal aspect, as well as the service liability in the case of the patient being invalided.

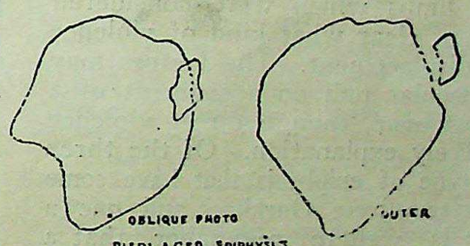
Ossification of the normal Patella.

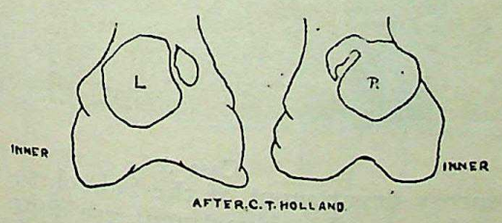
The patella normally ossifies by a single centre, which appears in the second or third year, or at the latest the sixth year. Occasionally the bone is developed from two centres, placed side by side. Ossification is complete at puberty.

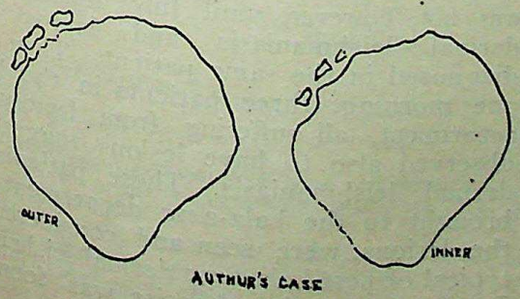
Rare ossification.

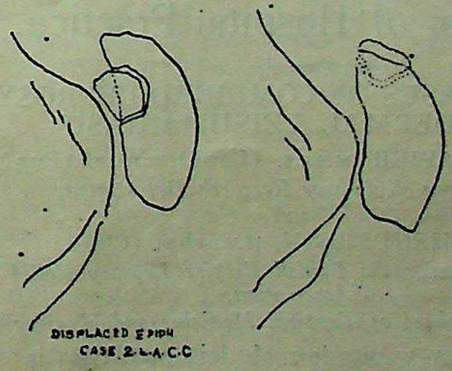
A third type of ossification occurs, and has been described by various writers. Previous to the year 1919 there was practically no literature on the subject, and the case records are still very small. Dr. C. T. Holland was probably the first radiologist to point out the value of recognizing the condition from the diagnostic and medico-legal point of view. He described one case (1921) and quoted another from Mouchet (1919). In these cases there was no displacement of the epiphysis, neither was the possibility of such an unusual occurrence mentioned in their writings. In order to demonstrate what the displacement of these rare epiphysis looks like, I reproduce drawings from Holland and Mouchet, and also from one case of my own. In these three cases no displacement has occurred. It will be best to examine these











CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

drawings before those of the two cases where there is displacement. One remarks (*a*) the fragmented appearance, (*b*) the lack of uniformity in all three cases, (*c*) the ossification is generally on the upper and outer side of the bone. One wonders whether Mouchet's case is not simply a modification of the type where the two centres occur side by side.

Displacement in cases of rare ossification.

Case 1.—D. B. R., a Gurkha, aged 35 years. He gave a history of having sustained an injury to his left knee at the age of four or five years. Since that time he has always complained of weakness of both knees. A year ago he had synovitis of the left knee, which was brought on by hitting his knee against a door. The condition got quite well. When *x*-rayed now he had synovitis of the right knee, which he stated was caused by a fall. Radiographically the right knee showed the rare type of epiphysis just described and the left knee showed the same type but in that case the epiphysis was displaced (*vide* drawing D. D. R.). There was no question of arthritis in this case.

Case 2.—L. A. C. C., a European, aged twenty-two. Was unable to remember any severe injury in childhood. As long as he remembers, both knees have been rather weak, but not markedly so. He fell on his left knee-cap five days ago. At the time of his *x*-ray examination he was practically well again, and was merely sent in order to exclude fracture. Radiographically his left patella showed the rare type of ossification without displacement, and the right patella showed the same type displaced backwards. There were no arthritic changes in the knee joints. The patient went back to his work after about a week.

Remarks.

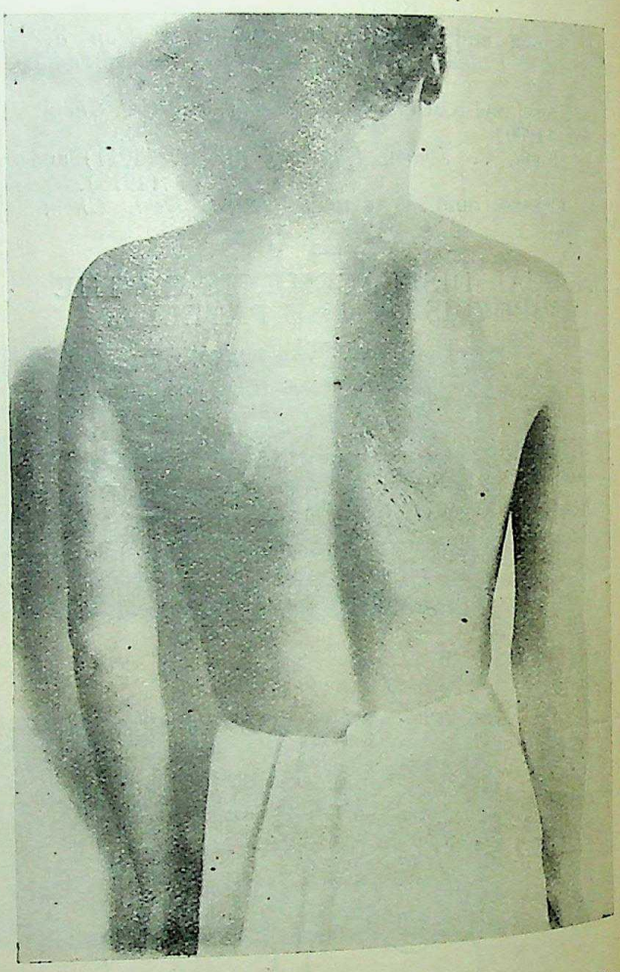
Both of these cases raise the interesting question as to when exactly did the displacements occur. Obviously it was some time before puberty. There was no question of compensation or liability as the displacements were seen in limbs which were considered sound. It is not clear what kind of violence produces the displacement. The factors may be sudden muscular pull on a segment of a young growing bone, though direct violence is the more likely explanation. Of the three cases of this type of epiphysis that have come to my notice, two were Gurkhas, and one a European. It is well to remember that a displaced epiphysis of the patella may not give rise to marked symptoms and, if it does, it is not possible to diagnose the condition without an *x*-ray examination.

A Mirror of Hospital Practice.

THREE CASES OF COMBINED LEPROSY AND DERMAL LEISHMANIASIS.

By L. E. NAPIER, M.R.C.S. (Lond.), L.R.C.P. (Eng.),
In-Charge, Kala-azar Research Department,
and
J. M. HENDERSON, M.B., ch.B. (Glas.),
Working under the British Empire Leprosy Relief Association,
Calcutta School of Tropical Medicine and Hygiene.

POST-KALA-AZAR dermal leishmaniasis is a comparatively rare condition. Up to the beginning of 1927 only 3 definite cases had been described in the literature; then Acton and Napier (1927) reported on 44 cases collected at the Calcutta School of Tropical Medicine and Hygiene during a period of about a year. Notes have been made on all cases attending since October 1927; since this date 80 more patients with this disease have been seen. A history commonly given by a patient suffering from this condition is that he has been advised by a doctor to take, and has taken, a full course of some anti-syphilitic preparation, naturally without improvement; he has then been told by another doctor that he is suffering from leprosy, and has been treated accordingly. Thus a very large proportion of our cases come *via* the



Case 3.

leprosy department of the School, so that the workers in this department are quite familiar with the lesions of dermal leishmaniasis. It was not, however, until July 1928, that both dermal leishmaniasis and leprosy were diagnosed in the same patient. Then during one morning, three patients in the leprosy department, all suffering from leprosy, were observed also to have lesions suggestive of dermal leishmaniasis. These patients were brought to the kala-azar department where the lesions were seen and considered to be typical of post-kala-azar dermal leishmaniasis. In two cases the parasite was found in a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

smear from a cut nodule; in the third, the nodules were not sufficiently developed, but the typical depigmented patches were present. The details of these cases are given below:—

Case No. 1.—A R., male, aged 28, Mahommedan, clerk by profession, resident of Calcutta.

Leishmaniasis.—He had kala-azar in 1925, he was ill for 6 months, was treated by urea-stibamine, 8 or 9 injections, and apparently cured: 2½ years after cessation of treatment a crop of small partly depigmented spots appeared on the back, chest, chin and left thigh.

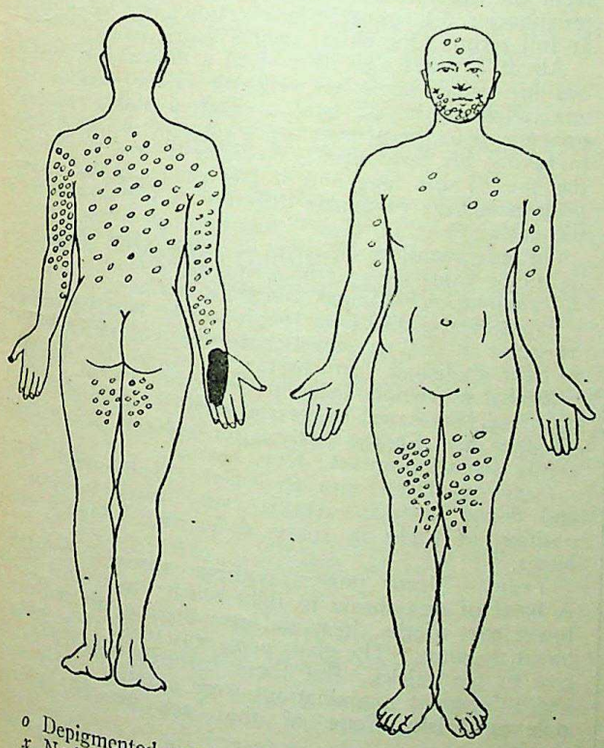
On examination numerous small scattered partly-depigmented spots of dermal leismaniasis were seen, especially on the back, the chest, and the inner side of the left thigh. Some of the lesions about the chin showed commencing nodulation.

Leprosy.—A few months ago a depigmented patch appeared on the back of his right wrist. This patch was larger than any of the other patches and shewed a red spreading margin. The patient first appeared at the leprosy out-patient department on 6-7-28, and examination on 10-7-28 revealed a depigmented patch with a slightly raised and erythematous border extending over the back of the right wrist for about 4 inches up the dorsum of the right forearm and down over the backs of the ring and little fingers on the right side. The patch was anæsthetic to light touch, particularly in the centre, and was associated with definite thickening and slight tenderness of the right ulnar nerve. Smears from the skin and nasal mucosa were negative for lepra bacilli. The case was, therefore, one of early leprosy.

Case No. 2.—B. B. B., Hindu male, aged 27, a resident of Calcutta and a silk merchant.

Leishmaniasis.—He suffered from kala-azar in 1923, and was ill for 3 years. He was treated by urea-stibamine, 45 injections, and apparently cured. About

Case 1.

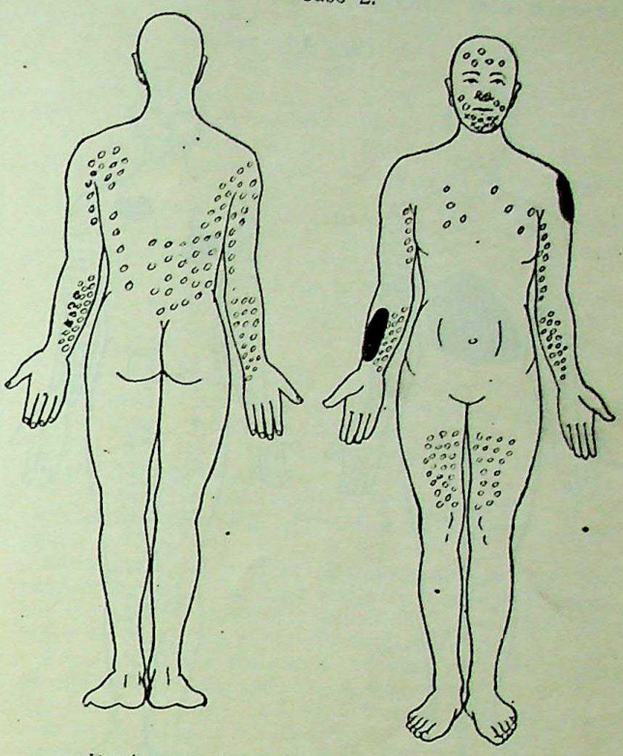


o Depigmented patches
x Nodules } Dermal Leishmaniasis.
Leprotic lesions black.

six months after his treatment had been completed he noticed a crop of small depigmented spots on his forearms and thighs.

On examination small depigmented and non-anæsthetic spots, clinically suggestive of dermal leishmaniasis, were noted on the forehead, face, chest, back, arms, forearms and inner sides of the thighs. There were a few small nodules on the chin and nose; a smear from one of the former showed leishmania in large numbers.

Case 2.



o Depigmented patches
x Nodules } Dermal Leishmaniasis.
Leprotic lesions black.

Leprosy.—Some months ago a large depigmented patch appeared on his right forearm.

On examination a depigmented and anæsthetic patch on the inner side of the right forearm with thickening and slight tenderness of the right ulnar nerve, a small depigmented and anæsthetic patch over the insertion of the deltoid, and slight thickening of the lobe of the left ear were found. No lepra bacilli were found in a smear from the nose or on examination of the skin clippings, but the lesions were typical of leprosy.

Case No. 3.—H. P. D., aged 30, Hindu male, a resident of Comilla.

Leishmaniasis.—Two and a half years ago he had kala-azar, and apparently received 5 injections of urea-stibamine. Shortly after the injections were discontinued he noticed depigmented patches on his arms and forearms. The nodules on his face had only recently appeared.

On examination the whole of his body with the exception of his hands and feet was covered with small non-anæsthetic and depigmented patches. There were two small nodules on the chin and one on the nose. A smear made from a cutting of one of the former showed the presence of leishmania.

Leprosy.—He had noticed a number of flat depigmented patches on his back and chest but he could not say how long they had been there. The centres of the patches were anæsthetic. He had nodules on his ears; a smear from the skin of the right ear showed the presence of Hansen's bacillus.

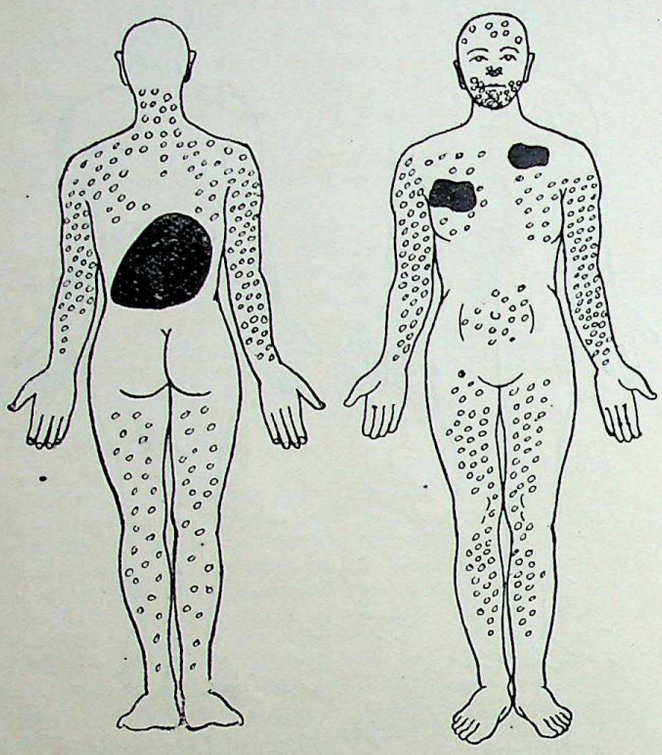
It is difficult to say in what proportion of kala-azar patients dermal leishmaniasis develops. In a small rural area, population about 7,000, where kala-azar investigations are being made, of about 400 patients treated by sodium antimony tartrate 3 are known to have developed dermal lesions, and the condition was found in two other persons who had not received treatment; of these one gave

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

a history of fever and cancrum oris. If this area can be taken as a fair sample of Bengal—and there is no reason to suppose that it is not—we can calculate that there are about

Case 3.



o Depigmented patches
x Nodules
Leprotic lesions black.
} Dermal Leishmaniasis.

30,000 cases of this condition in the province. Looking at it from another point of view, about a million patients have been treated for kala-azar in the hospitals and dispensaries in Bengal during the last six years; calculating at the rate of 0.75 per cent. amongst the treated and an equal number amongst the untreated (see Acton and Napier, 1927) by this method we arrive at the figure of 15,000 cases of dermal leishmaniasis in Bengal. In view of the number of cases seen at the School it seems likely that the former figure is nearer the truth. Let us estimate it roughly at 1 in 2,000 of the total population, 46½ millions.

There are probably about half a lakh of lepers, or roughly 1 per 1,000 of the total population, so that were there no ætiological relationship between the two diseases the chances against both diseases appearing in the same person would be about 2,000,000 to 1. This chance is further reduced by the fact that in the districts where leprosy incidence is high, e.g. on the lower slopes of the Bihar plateau, the incidence of kala-azar is extremely low, and *vice versa*.

In view of the fact that three totally unconnected cases were seen in one morning, we must assume that either our calculations are gravely wrong, or that there is some ætiological connection between the two diseases. Our calculations were altogether unscientific and subject to at least a ten-fold error, so that we must admit that the former is the more likely solution.

It is now nearly a year since these patients were seen, and only one other patient with the combined conditions has been encountered. This patient, an obvious leper, was sent by an outside leprosy treatment centre to the kala-azar department for our opinion regarding some nodules on the face; these proved to be due to leishmania infection.

REFERENCE.

Acton, H. W. and Napier, L. E. (1927). Post-Kala-Azar Dermal Leishmaniasis. *Indian Journ. Med. Res.* Vol. XV, p. 97.

TABES DORSALIS IN AN INDIAN.

By MOHAMMAD YUSUF,

Clinical Assistant to the Professor of Clinical Medicine, King Edward Medical College, Lahore.

In view of the fact that tabes dorsalis is extremely rare in India, the following case seems to merit a description.

X., a Hindu male, aged 55, was admitted to the Mayo Hospital on 15th November, 1928.

Complaint.—Loss of the proper use of arms and legs. Duration 3 years.

History.—Contracted syphilis at the age of 20; treatment indifferent. Married 3 years later. Wife had six pregnancies, 3 terminated by abortion and 2 by still-births at full term. One child, aged 8 years, living.

About 3 years ago he noticed a difficulty in carrying out his usual work of weighing heavy articles with an Indian pair of scales. The disability gradually progressed to the present condition when he has difficulty in taking his food even. A difficulty was noticed with the use of his legs and it has gradually and steadily progressed. A particular difficulty is felt in walking in the dark.

On interrogation he gives a very clear history of lightning pains of several years' duration.

Examination.—Mental functions normal.

Right Eye.—Disc hazy, pupil smaller than the left and irregular in outline; reaction to accommodation present, to light abolished. Involuntary ptosis of the upper lid, volitional movement being possible.

Left Eye.—Argyl-Robertson pupil.*

Upper and Lower extremities.—Motor power fairly good; sensation intact; tone, normal.

Reflexes.—Deep ones abolished. Plantar reflex brisk and flexor in type. Ataxia, very marked. Sense of position of limbs in space defective. Vibration sense intact.

Trunk.—Motor power, nothing special. Sensation: A band of anæsthesia to light touch was noticed in the lower part of the chest and over the scrotum and round about the anus. The glans penis was found to be insensitive to pin pricks. But these features were inconstant and subsequent examinations were negative. Abdominal reflexes brisk. Tone of the back muscles, nothing special.

Sexual functions.—Impotent. Bulbo-cavernosus reflex lost. Sphincters, action normal.

Wassermann reaction both in blood and cerebro-spinal fluid strongly positive.

He was put on anti-syphilitic treatment, but made no improvement and left the hospital.

* This report was furnished by the ophthalmologist.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Discussion: The positive features may be summed up thus:

(1) Lightning pains.

(2) Argyll-Robertson pupil; inequality and irregularity of pupils; involuntary ptosis of upper lid and optic atrophy.

(3) Loss of deep reflexes and briskness of the superficial ones.

(4) Ataxia.

(5) Positive Wassermann reaction both in the blood and cerebro-spinal fluid.

However, some of the features which are often present in this disease and were absent in this case may be considered.

(1) *Anæsthesia*: The absence of anæsthesia would not negative the diagnosis, because it is not a part of the essential lesion of the disease. When present it is limited to special areas and it so happens that in this case the lesion was not advanced enough in those areas.

(2) *Involvement of sphincters*: This again does not stand against the diagnosis. It is a sign of a lesion in a particular segment and it is conceivable that in any given case they may be spared, or the disease in them may not have advanced far enough.

(3) *Hypotonia*: Muscular tone depends, among other factors, upon the integrity of the posterior nerve roots and when these are involved there must be some defect in tone. However, minor degrees of defect cannot be definitely elicited, the tests being crude.

(4) Vibration sense is conveyed by fibres in the posterior columns and must be affected. But minute changes in this sense cannot be appreciated.

The absence of both these latter signs would not disprove the conclusion that in this case the posterior columns were the seat of the lesion. And all these negative features put together do not seem to outweigh the positive findings in this case.

I have to thank Major T. A. Hughes, I.M.S., the Visiting Physician, for his kind permission to publish this case and for his kind advice in writing it.

UNUSUAL INTRA-UTERINE TUMOURS.

By D. L. HARI, M.B., B.S. (Bom.),
Indian Women's Aid Society Hospital, Hubli.

T. B., aged about 23 years, a Hindu woman, came to the out-door department on February 27th, 1929, complaining of a general feeling of malaise and pain in the abdomen.

The examination result was as follows:—

Patient appears sick. Abdomen very much distended and tense; appears to be full term.

Palpation of Abdomen: Masses like a fœtal head felt in three places. Head not felt above the symphysis pubis. Limbs could not be felt.

Two fœtal heart sounds, one distinct on the right side below the level of the umbilicus, the other on the left side above the level of the umbilicus, could be heard.

Per vaginam, os one finger, loose.

On March 20th, she attended again with a similar complaint. On this occasion she was having labour pains and so was admitted.

Personal History.—Patient's father died 8 years ago; mother is still living. The latter had one abortion and 10 full term children, of whom 5 died. Now the patient has three brothers and one sister living.

Patient married at the age of 8, menstruated at the age of 16, and had her first child at the age of 17.

The second child was born three years after the first child. Both labours were normal, and both children are living.

Patient gives a vague history of having contracted syphilis from her husband, although there are no signs or symptoms to indicate venereal disease.

Examination *on admission* at 10-30 a.m. on 20th March. Patient looks sick, and seems to be having labour pains.

Pulse 90. Respiration 22, Temperature 98. Albumin in the urine.

Lungs.—Scattered ronchi and râles on both sides.

Abdomen.—Very much distended, reaching right up to xiphisternum. Irregular masses felt in more than two places. One fœtal heart sound on the right side below the level of the umbilicus.

Vaginal Examination.—Os fully dilated. Bag of membranes presenting. Patient is having good labour pains.

Membranes ruptured at 11 o'clock, and a very small head presented. The head was very loose in the vagina, but the midwife could not deliver the fœtus. So it was taken to be a case of interlocking of twins.

I examined the patient 10 minutes after the rupture of the membranes, and found the cervix blocked by a big fœtal abdomen, and so I thought that this was a case of fœtal ascites. Hence the fœtal abdomen was punctured above the umbilicus. No fluid drained out, so the size was not reduced.

The size of the fœtal abdomen was so big that it was impossible to deliver it without using some sort of traction. In order to do version and so deliver it by using traction on the leg, I decapitated the presenting head.

As I pushed the presenting abdomen up and tried to find the leg, I felt a solid head-like mass with a fissure in it. It felt like a hardened brain; this I thought might be the head of another fœtus without a scalp.

This was delivered first. It was found to be attached by a broad gelatinous pedicle. It was a pinkish white oblong tumour, with one longitudinal fissure in the centre on the upper part, and two or three transverse fissures reaching right up to the base. The appearance of it was very much like a hardened brain, without blood vessels.

The pedicle had no blood vessels in it. The circumference of this tumour was about 12 inches.

After this, version of the decapitated fœtus was done; but the legs that were brought out were so tiny and delicate that it was impossible to use traction on them, so I applied forceps to the presenting abdomen and delivered it with considerable difficulty. The circumference of this abdomen was 15 inches.

Next as I tried to find the legs of the other fœtus, I felt another tumour, exactly similar to the first one removed. I delivered it and found its circumference to be 10 inches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The legs of the other fœtus were brought out, but we had the same difficulty in delivering this too as the abdomen was also very big. We punctured the fœtal abdomen below the umbilicus, in the hope of getting it reduced, in case there was fœtal ascites. Only an ounce or two of straw-coloured fluid drained out. The size of the abdomen remained the same. With considerable difficulty this was also delivered. The circumference of the abdomen was 16 inches. The patient was having hæmorrhage, and as she was still under the anæsthetic I thought it best to remove the placenta manually. On passing the hand into the uterine cavity no definite placenta was felt but the whole cavity was lined by a soft velvety membrane, which felt very much like a vesicular mole. I scraped this as much as possible with the finger tips. The amount of this was about a bucket-ful (about 1 gallon).

After this she was given an intra-uterine douche with weak lysol solution. The uterine cavity was swabbed with 5 per cent. solution of tincture of iodine. The vagina was packed with iodoform gauze.

Examination of Fœtus. 1st Fœtus.—To find out the reason of this abnormal size of the fœtal abdomen, we opened it and found that it contained a tumour exactly like the other two removed from the uterine cavity.

It was attached by a thin rudimentary mesentery to the posterior wall of the abdomen; and next, close to the mesentery, attached to the tumour was a bunch of very small intestines, looking like a coil of greyish coloured string. All the other organs were very small excepting the liver, which was about the normal size. The ribs and clavicle were cartilaginous and so the arms looked as if they were attached to the back.

2nd Fœtus.—On opening the second fœtus, we found a similar tumour in the abdomen, attached in the same way and looking exactly like the first one. The tumour was 12 inches in circumference. The fœtus was quite œdematous. There were no eyes, but only fissures without openings. In place of the nose there was only a ridge. There were lips, but no openings of the mouth. The skin was more than half inch thick and there was no muscular tissue underneath.

The patient made an uneventful recovery and was discharged cured on 31st March, 1929. She reported last on May 1st. She is quite well.

A DISTENDED BLADDER SIMULATING A FULL-TERM UTERUS.

By CAPTAIN C. C. DAS GUPTA, M.B.,
C. M. O., Gopalpur Group of Tea Estates,
P. O. Gopalbagan, Jalpaiguri.

ON 12th January, 1929, I was asked to see a coolie woman, aged 25, multipara, said to be pregnant—full term, complaining of suppression of urine for 48 hours.

Past History.—Previous deliveries normal. Amenorrhœa for about 4 months. She previously passed urine normally.

History of Present Illness.—For the last two days she had not passed any urine. She noticed her abdomen growing bigger and bigger, causing her great discomfort.

Physical Examination.

Inspection.—I found the patient reclining on the mud floor with her head supported by a woman. Her legs were extended. She was in great agony. The abdomen was enlarged up to the xiphoid cartilage.

Palpation.—Abdomen was tense and tender. Fœtal parts not palpable.

Percussion.—Distinct fluid thrill present. Liver and spleen normal.

Auscultation.—Fœtal heart sounds and uterine souffle not audible.

Differential Diagnosis.

(1) Pregnancy, full term:—Fœtal parts not palpable. Fœtal heart sounds and uterine souffle not audible. Amenorrhœa of 4 months' duration only.

(2) Ascites:—Though fluid thrill was present, the sudden onset without any previous history of urinary trouble was against this.

(3) Enlarged bladder:—Stoppage of urine for 48 hours, attended with gradual enlargement of abdomen and pain suggested this.

A catheter was passed and a few pints of urine drawn off. The patient obtained instant relief and was able to move about.

Her abdomen was again palpated. The uterus could not be felt.

The abdominal swelling had almost disappeared.

Conclusion.—The retention of urine was probably due to spasm of the urethra. In introducing the catheter no stone or foreign body was felt.

The attending doctor had administered some homeopathic medicine to hasten delivery. He mistook her condition for delayed labour and did not believe her menstrual history.

A CASE OF ELEPHANTIASIS CURED BY ARRHENOL.

By MD. ABDUL QUIYUM, L.M.P.,
Medical Officer,
District Board, Darbhanga.

A MAHOMMEDAN male, aged 19, attended the Jainagar dispensary as an out-patient, during my incumbency, with swelling of his left leg.

On questioning, he narrated that about six months previously, he had had an attack of fever associated with intense pain in the left leg with a reddish, painful, linear mark extending throughout the limb. This lasted about a fortnight, but disappeared on application of some embrocation from a local sympathiser. Then, after a month or so, he began to notice a painless swelling of his limb which continued to increase for six months; the limb grew to double the girth of the other sound leg.

On examination I found that the swelling was solid, painless, and not pitting on pressure to any notable degree.

From the above history and the present condition of the patient I made a provisional diagnosis of filariasis. As arsenic has been said to be of much value in the treatment of such filarial cases, I chose arrhenol, an organic preparation of arsenic. The following morning I injected him intravenously with a solution of arrhenol (gr. ii to 1 c.c. of distilled water) and gave the following mixture.

℞	Tr. Ferri perchlor.	.. min. v
	Glycerine ..	.. ʒi
	Magn. sulph. ..	.. ʒii
	Spt. chloroformi ..	.. min. xv
	Aquam ..	.. ad ℥i

One dose thrice daily.

The intravenous injection of arrhenol was given every alternate day. To my great surprise, the swelling began to decrease just after the second injection. On finding some improvement I augmented the strength of the solution to grs. iii to 2 c.c. and continued the injection at the same intervals. The swelling went down marvellously, day after day, till after the last, the sixth, injection the leg recovered its normal size, almost equal to the healthy fellow limb in all respects. The patient was apparently cured to all aspects, but his blood was not examined to give a positive proof of a radical cure.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail)

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones.

The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

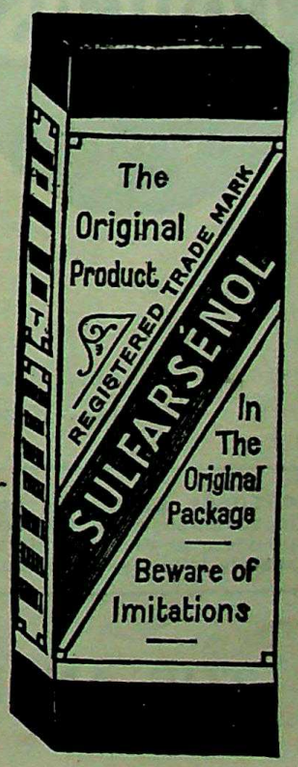
Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.



Warning.

Genuine SULFARSENOL, in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

OPOCRIN HEPAR.

Dose in Pernicious Anaemia 18 pills per day.

Special liver extract for Pernicious Anæmia, Antitoxic effects, to favour intracellular absorption of Glucose, and for diabetes when due to defective functioning of the liver.

Price, bottle of 50 pills Rs. 3.

ONE GRAMME CREOSAL CONTAINS

Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

For COUGHS whatever their origin

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

Send 8 As. stamps "for large sample bottle."

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY
P. O. Box 226, MADRAS

Telegrams: "ANTIPYRAS."

P. O. Box 7861, CALCUTTA.
P. O. Box 134, RANGOON.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

AUGUST.

EXERCISE IN THE TROPICS.

THE object of exercise is not the production in the individual of a state of complete exhaustion, nor is it the excessive development of the whole muscular system or of any particular group of muscles—the muscular giant whom one sees depicted as a symbol of health is not necessarily a "good life," in the insurance sense of the word—but the production of adequate and symmetrical development of all the muscles, and, by the maintenance of the circulation of the body fluids and the increase in the metabolic rate, the ensurance of the proper functioning of all the organs and tissues of the body.

The absence of exercise from the daily routine must mean that the muscles remain ill-developed, that the organs become congested and fail to function properly, and that the resistance of all the tissues of the body to invading pathogenic organisms is very low.

On the other hand, over-exercise in a hot climate throws a great strain on the heart and other organs, such as the kidneys, which, after most of the available fluid has been lost through the sweat glands, have to excrete waste products in a highly concentrated form; it leads to nerve and endocrine exhaustion; and the excessive increase in the metabolic rate causes the liberation of toxins from the organs, especially the liver, and other tissues of the body.

Exercise, as such, is necessarily a product of civilisation. The whole existence of the lower animals living in the wild state depends upon chasing or being chased, and domestic animals—with the exception of those extreme products of domestication, the dog and the horse—even if they are not beasts of burden, are usually compelled to cover considerable distances in collecting their food. The only glimpse of apparently purposeless muscular exertion that one sees is in the very young, the skipping lamb and the gambolling kitten, whose food is provided for them without any appreciable effort on their part, but this exuberance is soon submerged in the sterner realities of existence.

Our early human ancestors who had to hunt or fish for the food did not require any other form of exercise to keep themselves healthy. At the present day the labourer, the peasant and even the skilled mechanic do not find it necessary to take artificial exercise. As we ascend the social scale the first member of society we encounter whose health would be improved by indulgence in games or sports is the clerk who sits all day on an office stool; as far as the Indian is concerned, this is also the class of individual who has the least opportunity for such indulgence and who takes the least advantage of such opportunity as he has. It may be poverty which prevents him from playing games, but this poverty also makes it necessary for him to walk to his work each morning and back at night. His walk in the morning must be definitely beneficial to him, but it is very doubtful if he obtains much advantage to his health from his walk home in the evening on an empty stomach after a long and tiring day's work. On the contrary, he is probably much too tired to digest properly his evening meal. The better-paid clerk, who can afford a tram or bus fare to his work, and the clerk who lives near his office take practically no exercise at all; if they can afford a carriage or car they will probably take a drive in the evening, but they will not go for a walk. This is not laziness, it is habit. The wives, on the contrary, of this class of clerk have to do most of the house-work and do not suffer in the same way from lack of exercise. A very large percentage of the members of the well-to-do merchant class and the higher grade Indian officials, again, take no exercise whatsoever; their wives also, who can afford to pay a number of servants, do little house-work and suffer equally with their husbands from the ills associated with a sedentary existence.

On the other hand, the majority of students take part in games, such as football, cricket and hockey, and in other sports, such as running and swimming. A very few of them retain their interest in games when they have graduated—or failed, as the case may be; a small number take up tennis, and an even smaller number ride or play golf, but the large majority give up games altogether and, as we have said above, take no exercise except that which their daily duties entail.

The case of the European—our remarks are more applicable to the British-born—in India is different. From childhood he has drummed into him daily the importance of games and exercise. At school he is compelled to play games, whether he likes it or not, and with increasing self-confidence he soon overcomes any dislike he may have had for them. When he goes to college he continues to play his school games or takes up other games. If he is taught that exercise is important at home, it is impressed upon him when he comes out to India that his life is actually dependent on his taking sufficient exercise. So he plays tennis, or rows, or rides, but as he is kept busy in his office until 6 o'clock on each night of the week, he has to crowd all his exercise into the week-end. He is a young man with a healthy appetite, so he probably eats too much and possibly also drinks a little too freely, and soon he acquires a "liver."

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

His friends say "Ah, that is through not taking sufficient exercise." So next week-end he takes twice as much exercise and on Monday morning he arrives in his office an irritable, pessimistic and exhausted wreck. In time he finds that in order to keep fit it is necessary to take exercise during the week, but he still over-exercises during the week-end. He eventually becomes a slave to his exercise; he feels quite sure that he will be ill if he misses it for a single day. If he does miss it he certainly feels ill and possibly is ill. The worst exercise fiend is usually a somewhat portly man who quite obviously eats too much. He tries to balance excessive assimilation by increasing metabolism. If this man would eat half the amount he usually eats and would take half the exercise he usually takes he would be a very much fitter man and might even reduce his figure—and thus achieve his Mecca.

A definite rule for exercise which is applicable to everybody cannot be laid down. Some men seem to require more exercise than others, but this is very largely a matter of habit, and probably nearly anyone whose work does not confine him rigidly to one chair throughout the day could accustom himself to a very much more modest exercise routine than that of the average European of the present day, say one hour of tennis or half an hour of squash during the week, and two afternoons of tennis—of not more than 3 sets each if it is the hot weather—or two rounds of golf during the week-end. If he finds that he gets "livery" then he must look to his food for the cause and regulate his diet. For the man who never moves from his office chair the addition to a short daily walk would certainly be beneficial.

We have perhaps drawn slightly exaggerated pictures, but there is very little doubt that the European in India does on the whole tend to take too much exercise, whereas the Indian of the middle or upper class definitely takes too little.

THE PARASITOLOGY OF MALARIA: AN APPEAL FOR INFORMATION.

During the last six months the writer of this note, in conjunction with Mr. R. Senior-White, Malariologist to the Bengal Nagpur Railway, and Assistant Surgeon B. M. Das Gupta, Assistant Professor of Protozoology, Calcutta School of Tropical Medicine, has been engaged in the preparation of a memoir dealing with the parasitology of world malaria.

In January 1929 the detailed results of five years of blood examination of all suspected cases of malaria in the out-patient department of the Calcutta School of Tropical Medicine became available for analysis. A study of these results led one to a study of the literature, and what was originally intended to be a brief report has now swollen to the dimensions of a large memoir. Some thirty-five of the most important journals dealing with tropical medicine for the years 1900-1928 have been searched, and abstracts written of some six hundred papers. In short, the attempt has been made to review the parasitology of world malaria, as far as papers published in readily accessible journals deal with the matter.

The result of these studies is to reveal an amazing state of affairs. Wherever there is a French colony the information is full, detailed, complete, and published in readily accessible journals. In fact our knowledge of the parasitology of malaria with reference to the French colonial empire is fairly complete. The same remark applies to the Dutch East Indies, where the problem has been very thoroughly studied for Java and Sumatra at least.

But when it comes to the British Empire, the information is scanty in the extreme. There are important memoirs dealing with malaria as observed in certain areas during the Great War —Great Britain (among returned troops), Macedonia, Palestine, and Mesopotamia; full information is available in the journals for Ceylon, for Australia, and for some of the West Indies. For the rest, there is hardly any information at all to be had. For India, only some thirty-five reports deal with the subject. The malaria maps of both Burma and the United Provinces, for example, are both completely blank. Cyprus, Malta, and Trinidad are all blank.

Now one knows that throughout India—and for that matter throughout the tropical possessions of the British Empire—there are hundreds of laboratories which are engaged daily in the study of blood films for malaria parasites. Yet this information is apparently not published in the chief journals dealing with tropical medicine. It has been partly published in local and departmental public health reports, locally published and not available to the general reader; much of it, in fact, must be in the form of manuscript reports which have never been printed at all.

This renders an attempt at a general survey necessarily incomplete. Yet we realise that the work has been done; the investigations have been made; the information must be there, though not readily available. We have seen unpublished manuscript examples that are everything that we require.

We have once previously utilised these columns in a request for information. We now desire to do so again. It is unnecessary to add that any information supplied will be fully acknowledged in the event of publication. The points on which information is desired with regard to the parasitology of malaria in the British Empire

CC-0. In Public Domain. Gurukul-Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(and especially in India and adjacent countries) are the following:—

(*i*) The place or places at which the observations were collected, and the name of the observer (for publication of acknowledgments).

(*ii*) The time of the year at which the observations were made.

(*iii*) The class of persons observed; e.g., children in a malaria survey, or patients admitted to hospital.

(*iv*) The actual parasitological findings; e.g., number of films examined, number found positive, number of infections with *Plasmodium vivax*, *P. malariæ*, and *P. falciparum*, respectively.

(*v*) Whether thin films or thick films, or both were examined.

(*vi*) If observed, the ratio of gametocytes to other parasite forms encountered.

(*vii*) Any other parasitological findings, such as relationship of infections to age, race, sex, occupation, caste, duration of the infection, etc.

There must be many of our readers in a position to supply such information, and Lieut.-Col. R. Knowles, I.M.S., Calcutta School of Tropical Medicine, Central Avenue, Calcutta, would be most grateful for any information sent in.

Medical News.

THE JOURNAL OF NUTRITION.

THE subject of nutrition is to-day receiving more and more attention in medical circles, and the appearance of this new journal is therefore very opportune. Its first number was published in September, 1928. It is to be issued bi-monthly; the subscription is 21*s*. per annum (including postage), and the sole British agents are Messrs. Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden, London, W. C. 2.

The Journal of Nutrition is published by the American Institute of Nutrition, and is under the editorship of Dr. Eugene DuBois, assisted by a very strong editorial board. The number for September, 1928, contains much matter of interest, and the new journal is clearly of high scientific status. Dr. H. M. Evans of the University of California deals with the effect of inadequate vitamin B dietaries on sexual physiology in the male—an experimental study. The same author also deals with the relationship of vitamin E to growth and vigour. From the Nutrition Laboratory, Columbia University, Rose and MacLeod deal with supplementary values among foods. Simmonds, Becker and McCollum from the Johns Hopkins University contribute an article on the distribution of vitamin E. Barnett Sure, from the University of Arkansas, deals with the rôle of vitamin B(1) in anorexia in the white rat. Dr. M. Elizabeth Marsh of the University of Rochester deals with the character of energy metabolism during work, giving an account of experiments on seventeen subjects made with the bicycle ergometer. A special feature of the journal will be its editorial reviews, which will include most useful bibliographies. The editorial for September, 1928, deals with vital economy in human food production, and reviews the progress made from the days of Lavosisier to the present day studies in the Pennsylvania Institute.

The *Journal of Nutrition* is a most welcome addition to medical and scientific research literature.

INTERNATIONAL MEDICAL POST-GRADUATE COURSES IN BERLIN.

THESE are arranged with the help of the medical faculty of the University by the Lecturers' Association for medical continuation courses and the Kaiserin Friedrich-Haus. Part of the courses take place permanently, part only in October 1929 and March 1930.

I. Permanent Courses.

(*a*) Of monthly and semi-monthly duration dealing with all kinds of branches of medicine.

(*b*) Courses as guest-assistants in clinics, hospitals and laboratories during 2 to 3 months and longer for gentlemen desiring to do practical work under systematic supervision.

II. Courses in October, 1929.

(1) Group course: "Progress in internal medicine with special regard to stomach and intestinal diseases" (from October 1st—12th), fee RM. 75.

(2) Course for neurology, psychiatry and psychology (from October 14th—19th), fee RM 50.

(3) Postgraduate course in the domain of children's diseases (from October 14th—26th), fee RM 100.

(4) Course dealing with the chemical and physical foundation of medicine (from October 21st—26th), fee RM. 50.

(5) Postgraduate course for throat, nose and ear-specialists (from October 7th—19th, relatively 26th), fee RM 100.

(6) Single courses on all special fields of medical science including practical work.

III. Courses in March, 1930.

For March 1930 the following courses are contemplated:
A course on the different branches of internal medicine.
A course on the progress in the domain of surgery.
A course on skin and venereal diseases.
An *x*-ray course.
A course on obstetrics and gynæcology.

The courses are held in German, but numerous professors are able to lecture in the English, French and Spanish languages.

The information bureau of the Kaiserin Friedrich-Haus für das Arztliche Fortbildungswesen, Berlin, N.W. 6, Luisenplatz 2—4, is instrumental in procuring suitable lodgings, gives information as to cost of stay, arranges the attendance in clinics at operations, etc., and upon request sends detailed syllabuses.

SPECIAL ARTICLES.

THE SPLEEN.*

By S. L. BHATIA, M.C., M.A., M.D. (Cantab.),
M.R.C.P. (Lond.),
MAJOR, I.M.S.,
Professor of Physiology and Dean,
Grant Medical College, Bombay.

THE spleen is an extremely elusive organ, and its functions have always been somewhat of a mystery. It has been known since ancient times that it could be removed from the body without fatal results. The spleen of runners used to be removed to make them more speedy. Malpighi records some interesting experiments, showing that splenectomy in dogs is followed by voracious appetite and polyuria. Recent work, however, does not confirm this. As the spleen was not found to be necessary to life, it used to be regarded as an organ of no great importance, but we know now that it plays an important part in the economy of the body. It is the

* Being a paper read at the November 1928 meeting of the Bombay Branch of the British Medical Association.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

largest lymphoid structure in the body, and is concerned with blood cell formation and blood destruction; it acts as a reservoir for the red corpuscles and has important functions in connection with metabolism (especially of iron), immunity, tumour formation, etc.

The characteristic features of the histology of the spleen are the large size of its blood vessels, and presence of plain muscle fibres in the capsule and trabeculæ. The lymphatic vessels are present just beneath the capsule only, in spite of the large amount of lymphoid tissue in the Malpighian follicles. There is a plexus of non-medullated nerve fibres accompanying the splenic artery and its branches. The large amount of plain muscular tissue causes rhythmic contractions, producing variations in its volume. The course of the blood circulation through the organ is interesting.

Branches of the splenic artery enter the trabeculæ and give off branches which enter the pulp and run as central arteries of the Malpighian follicles. Here capillaries are given off, some of which end in the follicle, others connect directly with the venous sinuses. The central artery itself enters the pulp, where it becomes an end-artery, breaking up into the penicillii of Ruysch,—branches which have a peculiar stopcock arrangement known as *hulsenarterie* or sheathed arteries. The spleen is the only organ where such an arrangement exists. These branches either terminate as fenestrated end-chamber vessels, through which the blood enters the pulp, or connect directly with venous sinuses, which also have a characteristic structure. Their walls are incomplete. They are lined with large spindle-shaped cells loosely arranged, bound together by a delicate basket work of elastic fibres. The blood, after coming in very intimate contact with the cells in the pulp, enters them through apertures or tube-like branches. From there it drains into the veins in the trabeculæ, which join and enter the main splenic vein. This arrangement is well suited for storage of blood and for cellular metabolic changes. The spleen pulp contains a large variety of cells, namely lymphocytes and lymphoblasts in the Malpighian follicles, cells of Aschoff's reticulo-endothelial system, splenocytes, erythrocytes, polymorphonuclear leucocytes, platelets, and pigment granules which may be extra- or intracellular, etc.

Developmentally, the spleen is composed of mesenchyme covered by thick mesothelium, and arises from the mesoderm in the dorsal mesogastrium in the fifth week of fœtal life. It is later broken up by blood vessels and trabeculæ from the capsules forming the reticular tissue and cells of pulp cords. Infiltration of lymphocytes into the tunica adventitia of arteries gives rise to the Malpighian follicles. The sinuses are formed from veins. From the reticular and endothelial elements of the spleen in fœtal life erythrocytes and leucocytes are formed. This function is taken over by the bone marrow after birth. Both in prenatal and postnatal life the spleen is intimately related to the hæmopoietic and vascular systems in the body. Its important relationship with the vascular system as a reservoir of red corpuscles has been brought to light by the recent work of Barcroft and his associates at Cambridge.

In the end of 1921, Professor Barcroft, Professor Meakins and Mr. Doggart went to the Andes to study alterations in the hæmoglobin caused by high altitudes. When their ship, *S. S. Victoria* of the Pacific Steam Navigation Company, passed from the Atlantic into the Carribean Sea, they observed that their blood volume was increasing. Not only the quantity of fluid, but the hæmoglobin content of the blood mounted up also. These observers wanted a base line of normal data for the blood at sea-level for comparison with their observations in the Andes mountains, but they found the results of their observations puzzling.

Thus writes Barcroft: "up went the blood volume day by day; up went the hæmoglobin, and this went on till we reached the Panama Canal, when a change took place and the tide of hæmoglobin, so to speak, commenced to abate. By the time we reached Callao, both the blood volume and the hæmoglobin in circulation were above the normal figures, but much below the Panama maximum. What was the explanation? Was it some error in instruments, or was it a real phenomenon, and if the latter was true, what was its explanation?" They observed that the curve of their blood volume ran almost parallel to that of the mean temperature of their cabins, rising as they approached the tropical heat of central America, falling as they entered the cooler zone on the West Coast of South America. The mystery therefore was: "Whence came this outpouring of blood with rise of temperature." Is there any hidden store of blood in the body which can be drawn upon in case of emergency? Barcroft's investigations show that this hidden store is in the spleen, which may be regarded as a reservoir or bank so far as hæmoglobin in the body is concerned.

The most useful method of approach adopted by Barcroft to investigate the functions of the spleen is to withdraw it from the abdomen and fix it externally on the abdominal wall under aseptic conditions. Its blood supply remains intact. This extracutaneous spleen was demonstrated by Barcroft at Stockholm in 1926 at the 12th International Physiological Congress. He brought two dogs on whom this operation had been performed some weeks beforehand. One of them was run over by a motor car and died, but the other gave a most impressive demonstration of the fact that the size of the spleen diminishes as the result of exercise. This I had the opportunity of seeing. I saw similar demonstrations at a meeting of the Physiological Society in 1927. The spleen in the living animal is much bigger than the post-mortem organ. In anoxæmia it contracts and diminishes in volume. The reduction also occurs during carbon monoxide poisoning and hæmorrhage. The contraction occurs only if the nerve supply is intact. With rise in external temperature, there is dilatation of the skin vessels to facilitate heat loss. The spleen then parts with its store of blood to supply this additional vascular bed. With the fall in temperature, the skin vessels constrict, and the reserve supply of blood is again restored in the spleen. It may be regarded as an erectile tissue, which is capable of marked increase and diminution in its volume. During rest it is deep red in colour. During excercise it becomes pale. In a recent paper Barcroft has investigated the effect of pregnancy and menstruation on the size of the spleen. The extracutaneous spleen of the dog shrinks to about half its volume during the period of "heat" and to a somewhat greater extent during pregnancy. It reaches its smallest size a few days before the birth of pups. This shrinkage is due to the necessity of supplying blood to the uterine area. This knowledge of the reservoir function of the spleen is one of the most important additions to our knowledge with regard to this organ in recent years.

As regards actual blood cell formation, there is no doubt that owing to its large amount of lymphoid tissue, it plays an important part in supplying lymphocytes to the blood. In fœtal life, it is actively engaged in forming red cells. In the adult normally it does not perform this function. It however has an indirect influence on blood formation through a stimulating action on bone marrow.

The spleen plays an important part in the destruction of red blood corpuscles by virtue of its reticulo-endothelial cells, which form an iron-free pigment, bilirubin. This is discharged into the blood. The blood platelets, too, are destroyed in the spleen.

The free iron resulting from the destruction of red blood corpuscles is stored in the spleen. It is the richest storehouse of iron in the body. This may be carried to the bone marrow and made serviceable for the formation of fresh hæmoglobin. After splenectomy the storage of iron is interfered with and there is increased excretion through the kidneys. This aspect of splenic function is much emphasised by continental observers.

The spleen forms hæmolytic antibodies and plays an important part in immunity against tetanus, diphtheria, kala-azar, typhoid, malaria, etc. It is generally free from tumour formation, and probably provides a defensive mechanism against the development of foreign tissues.

There is some evidence to show that it produces an internal secretion from broken down red blood corpuscles.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

which reduces the resistance of all erythrocytes. As a hormone, after modification in the liver, it stimulates the formation of new red cells by the bone marrow.

It is closely related to all members of the hæmopoietic system.

The effects of splenectomy are not constant. Speaking generally, there is anæmia of the secondary type, from which there is a slow recovery. There is diminution of red blood corpuscles and percentage of hæmoglobin. Hæmorrhage after splenectomy is less well tolerated. There is some over-growth of the red marrow by way of compensation. There is asthenia and diminished capacity for exercise. A temporary increase in platelets and also in the number of leucocytes, especially of the polymorphonuclear variety, is found. The red cells become more resistant to hæmolysis by hypotonic saline solution. Many of its functions are taken over by other members of the hæmopoietic system, but there is no doubt that without the spleen the animal is considerably handicapped.

A DISTRICT SCHEME FOR CHOLERA CONTROL.

By CAPTAIN J. M. PEREIRA, L.A.H.L.M. (Dub.),
Civil Surgeon, Santal Parganas.

THIS scheme was started five years ago as an experiment, with very meagre equipment, which I managed to get up myself, and as the venture proved particularly successful, we were permitted by Government to adopt it as a permanent measure in our district for the following reasons:—(*a*) The outlay, to begin with was comparatively small; (*b*) the recurring charges reasonable; (*c*) the method of first information was quickest, unlike the usual filtering through a chowkidari system; (*d*) the staff necessary to carry the scheme consisted largely of personnel already in District Board employment, and the organisation on the whole struck the authorities as practical.

With the usual medical organisation of each district, consisting of: (*a*) the outlying rural dispensaries; (*b*) the sub-divisional headquarters dispensaries; (*c*) the district headquarters *sadr* hospital.

I have divided the cholera areas to be combated into three heads; all the rural dispensaries under (*a*) the "first line of defence"; all the sub-divisional headquarters dispensaries under (*b*) as "the second line of defence"; and the district headquarters as the "base and reserves." From this it may be seen that an endeavour is made to link up the entire scheme by an organisation already existing, and the administrative control under which the success of the scheme depends is already there as a powerful nucleus to set the machinery going. The details of the scheme are as follows, and must be considered under:—

A. The division of the district into areas of control.
B. Equipment.
C. Staff.
D. Information or Intelligence.
E. Initial cost and recurring charges.

A. *The division of the district into areas of control.*—As the outlying rural dispensaries may be considered the smallest unit of the district medical organisation, these units which are in direct touch with rural conditions I place as my "first line of defence," and equip them with one unit of equipment called a "cholera unit box." The medical officer, dresser and staff are already there, and a radius of five miles is allotted to this unit to look after. This brings roughly eighty square miles under the direct control of a medical man and his staff. The duties he is called upon to do during any recent outbreak more than compensate for his absence from hospital for half a day, and the economic loss that may result from his absence for one morning from his out-patient table is out-weighed by the preventive measures on cholera duty that morning.

B. *Equipment.*—The unit of equipment consists of a box called a "cholera unit box" size 15 inches × 13 inches × 9 inches high, containing material to sterilise with chlorogen 40 drinking water wells, disinfectants to do about ten village houses, drugs to treat 25 cases, in addition to material for contacts, soap, towel and brush, and a hundred doses of cholera vaccine. The contents of the box are so arranged and the directions so given that apart from cholera inoculation, any intelligent layman can handle it rationally. This may be seen from the following copy of the instructions which are pasted into the lid of the box.

Cholera Unit Box.

Contents.

Cholera mixture (essential oils)	6 ozs.
Tr. Iodine	6 ozs.
Potassium Permanganate	1 oz.
Chlorogen	3 bottles.
Phenyle	1 bottle.
Towels	1
Nail brush	1
Soap cakes	1
Ounce glass	1
Minim glass	1

Directions for use.

A. *Treatment. Essential oils mixture:*

(1) Oil of cloves, oil of juniper, oil of cajuput of each one part, spirits of ether, two parts, mix, shake bottle well; 20 drops in an ounce of cold water, given by mouth every 20 minutes, till there is improvement. Later the dose may be given every half, one, or two hours.

(2) Solution of potassium permanganate must be given freely as a drink, all the time. A small crystal, in a pint of cold water, just enough to pink it.

(3) Warmth must be applied with hot water bottles to the feet and stomach.

B. *For contacts of patients.*—10 drops of tincture iodine, in an ounce of cold water, thrice daily for two days, especially the patient's attendants.

C. *Disinfection and sterilisation.*

(1) Drinking water supply. Wells. About three ounces of chlorogen to an ordinary sized well. Mix in a bucketful of water, throw it into the well. Mix thoroughly.

(2) Patient's room, vomit and motions to be disinfected with strong solution of phenyle of strength one ounce to a bucketful of water.

(3) Tank water must be boiled and cooled before use, or sterilised with chlorogen; strength half a teaspoonful to a bucket of water (2-gallon capacity).

Considering that practically every sub-division of a district has only one outlying dispensary, it will be seen that as the result of dividing areas into centres of control in our first line of defence around each outlying dispensary, there will necessarily remain certain plots that do not come within any sector. These naturally have to be catered for, and have been allotted to the Sub-Inspector of Vaccination, who is an officer of the vaccination department in this district and stationed in each sub-division. With the vaccinating season ending in March, this officer has nothing to do till October, a period which coincides with our epidemic season, and I have allotted him definite duties in this interval. These officers with their area represent the second line of defence, and in addition to the duties allotted to the first line (excepting inoculation) are in charge of material equal to ten cholera units (in addition to his own unit for his own use), mainly intended to subsidise the first line when they run short. The additional staff of the second line consists of a whole time sweeper to help the Sub-Inspector of Vaccination. In practice and within the last two years, I have omitted to include cholera vaccine in my second line, as this is expensive and the renewal of unused time-expired material was wasteful. I have since found it just as quick to send vaccine from headquarters as the result of motor transport being available throughout the district.

Third line of defence or base reserves.—The staff here is mixed and maintained by the District Board and the Public Health Department. The equipment of the entire organisation at the base is fully paid for by the board, and with cholera vaccine now issued free of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

charge by Government the recurring charges have been greatly reduced. The board pays for an epidemic medical officer, chaprassi and sweeper maintained throughout the year, and the public health department pay for four men trained in cholera epidemic work for the season. The base equipment primarily consists of (*a*) refills for the entire organisation, (*b*) material and equipment for the epidemic medical officer referred to, and for the four men of the Public Health Epidemic Staff. The medical officer's equipment calls for special mention and consists of a section of the base which we term the "flying column." The medical officer in charge is liable to be sent out on duty anywhere and at any time that he may be required. The equipment of the "flying column" is as follows:—

List of Drugs and Equipment in the Flying Column.

1.	Chlorogen	12 bottles.
2.	Phenyle	1 gallon.
3.	Cholera Mixture	20 ozs.
4.	Tr. Iodine	2 lbs.
5.	Spt. Vin. Recti.	1 lb.
6.	Cholera Vaccine	1,000 c.c.
7.	Kaoline 5 lbs. in each box ..	2 boxes.
8.	Hand stove	1
9.	Pot. Permang. crystals ..	8 ozs.
10.	Towel	1
11.	Nail brush	1
12.	Record Syringe with 2 spare needles	1
13.	Ounce glass 4 ozs. capacity ..	1
14.	Rogers' saline apparatus complete	1 set.
	Contains the following:—	
	(*a*) Saline Tabloids	4 tubes.
	(*b*) Pot. Permang. pill, 100 in each box	2 boxes.
	(*c*) Tabloid Hg. Perchlor, 8¾ gr. in each box of 50 ..	1 bottle.
	(*d*) Adrenalin boxes (Amp. of 6 each)	2 boxes.
	(*e*) Pituitrin boxes (Amp. of 6 each)	2 boxes.
	(*f*) Camphor-in-oil (Amp. of 6 each)	2 boxes.
	(*g*) Atropine-sulph. 1/100 gr. ..	1 tube.
	(*h*) Dressings.	
	(*i*) Carbolic soap	1 cake.
	(*j*) All-glass hypodermic syringe 1 c.c. with 4 needles ..	1
	(*k*) Minim glass	1
	(*l*) Suture and needles, surgical (2 half and 2 straight) ..	4
	(*m*) Suture silk	1 hank.
	(*n*) Straight knife	1
	(*o*) Graduated transfusion flask ..	1
	(*p*) Silver cannula with rubber tube	1
	(*q*) Dressings forceps	1
	(*r*) Pipette with teat	1
	(*s*) Scissors, one pair	1

The "flying column" equipment contains material sufficient, (*a*) to inoculate a thousand persons, (*b*) to sterilise with chlorogen a hundred wells, (*c*) material (Essential oils' mixture) to treat a hundred cholera patients, and disinfectants, etc., for contacts and houses. It has in addition complete equipment for transfusion work, and the usual surgical and medical paraphernalia needed in such cases. The entire equipment is packed in a box of separate compartments, to save breakage, and render its contents easily accessible, size 27 inches × 17 inches × 14 inches high.

The four epidemic men referred to are each equipped with a cholera unit box without vaccine, and there are four extra cholera unit boxes reserved as spares. These men are intended as workers primarily for the second line of defence, but are available anywhere.

Each of the base staff is provided with a serviceable haversac, a water bottle, and hurricane lantern, and the epidemic medical officer has in addition a quick-light stove, a mosquito net, a rope and bucket. The entire staff is inoculated at the beginning of each season. The remaining portion of the base equipment include half a dozen rakes and shovels for village cleaning, a McKenzie's spraying pump, tools, etc., for packing and sending out parcels.

Intelligence.—In this district we have educated the school *gurus* to a sense of responsibility and requested their help in working this plan. As a first line of information they are invaluable to the first line sector, and there are great possibilities if a local organisation can be worked up in village schools with the help of cholera informers, organised from selected schoolboys, chosen from various areas of each village. A system of rewards for the first information, and a system of coloured postcards, for cholera and small-pox separately, printed with address for each sector, and distributed to *gurus* will be an asset. The same system may be extended to the chowkidars, to stimulate their apathy to their pecuniary advantage by a system of rewards.

Below I append figures showing the progress in the total number inoculated each year, and it is a pleasure to add that I have on several occasions received written requests from villagers asking for inoculation and for the help of an epidemic doctor.

Population .. .. 1,798,639.

Year.	Number of inoculations performed.
1924	575
1925	1,378
1926	3,368
1927	9,236
1928	18,782

A statement from each out-going unit on their return showing work done under various heads, e.g., inoculations, patients treated, wells disinfected, etc., is kept in the office, giving us a precise record of the output of each year.

The staff worked at headquarters of the campaign consists of a graph, on a skeleton map of the district, which hangs in my office, marking out centres of control in the first and second line of defence, and a circle round each centre precisely divides one sector from the other. On first information, small flags are pinned to the affected areas, depicting the general way of advance, and these when read together help to form a definite plan of attack. This is found particularly useful after *melas*, fairs, etc., along lines of communications.

Initial cost and recurring charges.—The initial cost will depend on the size of the district and may be gauged from the cost of one fitted cholera unit box and the flying column. A list showing the cost of the special equipment maintained at *sadr* headquarters is also attached.

	Rs.	As.
Cost of one cholera unit box	21	0
Cost of flying column equipment ..	300	0
Cost of McKenzie's spraying pump ..	60	0
Cost of water bottle	10	0
Cost of waterproof haversac	10	0
Rakes for cleaning villages at the rate of ..	2	4
Cost of manufacturing each cholera unit box	6	0
Cost of manufacturing flying column equipment case	14	0

With 21 centres in the first and second line and a liberal base supply, the initial expenditure with staff amounted to Rs. 5,000 and the recurring charges to about Rs. 2,000 annually.

Current Topics.

Some Ophthalmic Emergencies in General Practice.

By A. MAITLAND RAMSAY, LL.D., M.D., F.R.F.P.S.

(*The Practitioner*, April 1929, Vol. CXXII, p. 225.)

THE first duty of the practitioner is to inquire fully into the history of the accident, because by that means he is likely to learn a great deal regarding its nature.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A good clinical history is always a great help towards a correct diagnosis. For example, an injury will vary according to the character of the object with which the eye was struck—a stone, a fork, a knife, a pellet from a toy pistol, to name only a few of those most frequently responsible. While the history of the case is being taken the child should be laid on its back in a good light, and told to keep both eyes shut. If a few drops of 2 per cent. solution of cocaine be placed in the hollow at the inner canthus they will find their way into the conjunctival sac with every slight movement of the lids, and the eye will be anæsthetized by the time the doctor is ready to examine it. Cocaine will be of little use, however, if the child be very nervous and frightened, and in these circumstances a general anæsthetic will be required. It is very unsatisfactory to try to examine the eye while the child is screaming and struggling.

The skin should be inspected in the first instance and the tension of the eye estimated by gentle palpation with the finger before making any attempt to separate the lids. If the tension be greatly reduced the eyeball has almost certainly been perforated, and it is well to be aware of that fact as soon as possible in the course of the examination. With antiseptic precautions the lids should be separated to get a good view of the eyeball. It is hardly necessary to say that all rough and awkward manipulations must be avoided, and if a retractor for the upper lid be not available, a serviceable substitute can be improvised by bending a hairpin. The conjunctival sac should be explored carefully. It is very unfortunate to overlook a foreign body in the retrotarsal fold or beneath the upper lid. Aided by a good light, the cornea must be examined for any abrasion of its surface. If nothing more than a superficial abrasion be discovered, all the treatment necessary is to instil a few drops of 10 per cent. to 20 per cent. solution of argyrol and to apply a compress and bandage. Argyrol is advised, not on account of its reputed antiseptic properties, but because its solution is so heavy that it finds its way into every part of the conjunctival sac and acts as a thorough scavenger. If septic infection of the abrasion be avoided, the epithelium of the cornea will be reproduced very rapidly and no scar will remain.

When the accident is more serious it is convenient to divide the cases into two groups—those in which there is no perforation, and those in which perforation has occurred.

(1) *When the eyeball has not been perforated.*—The chief signs to look for in making a diagnosis are as follows:—(*a*) The anterior chamber is full; (*b*) the pupil is circular and responds to the stimulus of light; (*c*) the tension of the eyeball is normal. First aid must be given without delay. Instil argyrol and apply a compress and bandage. In this group of cases, however, the injury to the cornea is usually extensive and deep, consequently there is considerable danger that sight will be affected as a result of opacity or of irregular astigmatism of the cornea. Moreover, there is always a risk of sepsis, consequently it is prudent to keep the patient in bed. Rest is essential for the smooth healing of all injuries. In other parts of the body recourse is usually had to the support of a splint, and the same principle applies to injuries of the eye for which atropine is the physiological splint. It can be used in 1 per cent. solution and is usually instilled after the argyrol. The timely use of a mydriatic is the best preventive treatment of iritis, which is one of the most dangerous complications of this group of injuries. As a rule, no further treatment will be necessary, but, whenever, the injury appears so severe that sight is likely to be damaged, the family doctor will be well advised to ask for a consultation with a specialist before any complications arise.

(2) *When the eyeball has been perforated.*—It is essential to obtain a good view of the eyeball. When the eye is properly seen the diagnosis is not difficult if attention be paid to the following signs:—(*a*) The anterior chamber is empty; (*b*) the pupil is contracted and irregular in outline, and does not respond to the stimulus of light; (*c*) the iris is usually prolapsed through the wound in the cornea; (*d*) the lens may be wounded. It is important to take note both of the outline and of the general appearance of the pupil. A prolapse of the iris may be difficult to see and can easily be overlooked; but even although the actual prolapse may not be seen, it is a sure sign if the pupil has a pyriform shape. This special alteration in the outline of the pupil is due to the iris having been drawn into the lips of the wound of the cornea. If further examination shows that instead of being jet-black the pupil presents a grey reflex, the diagnosis of traumatic cataract can be made with confidence.

In these circumstances the eye is in grave danger, and the family practitioner, after rendering first aid, ought to rid himself of any further responsibility by transferring the case to a specialist at the earliest possible moment. The prognosis, however, will depend upon the first-aid treatment, which ought always to be as simple as possible. There should be no unnecessary handling of the eye, and copious douching, the use of strong antiseptics or of lotions containing lead must be avoided. A 10 per cent. solution of argyrol may be used freely, and if there be a prolapse of iris towards the centre of the cornea, 1 per cent. atropine should be instilled, but if the prolapse be at the periphery of the cornea, 1 per cent. eserine ought to be employed. The object of the treatment in both instances is to replace the iris into the anterior chamber by pulling it free from the lips of the wound in the cornea. A prolapse of iris is always a source of grave danger, but the family practitioner should never try to excise it. The operation is not so easy as it may appear, and to ensure success the operator requires to have considerable experience of ophthalmic surgery and also to possess suitable instruments. The skin of the eyelids and side of the face should be painted with a 1 per cent. tincture of iodine, a compress and bandage applied to the eye, and the patient put to bed to await the arrival of the specialist, or sent to him forthwith for further treatment. It is quite likely that the child's parents may express the wish to wait for a day or two before consulting a specialist, but the family practitioner ought not to approve of delay. Serious complications may occur very unexpectedly, and when they supervene the eye may be lost, even although the subsequent treatment has been directed by the highest skill. There is always danger ahead, because it is in perforating injuries that sympathetic inflammation is prone to attack the uninjured eye with the tragic result that sight may be lost in both eyes.

A case of acute glaucoma.

No excuse is necessary for including acute glaucoma among the emergencies of general practice. In many instances it comes as a bolt from the blue. The patient —very often a woman about fifty years of age—goes to bed apparently in her usual health, but is awakened in the early hours of the morning by agonizing pain in the head accompanied by feverishness, nausea, persistent retching, and bilious vomiting. The symptoms are so alarming that the family practitioner is called in haste, and unless he knows well what he is about he may easily do more harm than good. When he arrives at the patient's bedside it is quite probable that no one will mention the eye; all attention has been concentrated on the general symptoms, so that even although failure in sight has been noticed it has been tacitly assumed to be due to biliousness. The true nature of the condition may very easily be overlooked, and if the practitioner be deceived the result will be deplorable. In such circumstances the possibility of acute glaucoma should always be kept in mind. It is not by any means a common disease, and a practitioner may be in practice for many years before he is called to a case. Nevertheless, every country practitioner ought to know about glaucoma, and be able to recognize the disease when he meets it. If he does not allow himself to be taken unawares there is not much difficulty in the diagnosis. The most important factor is to remember to examine the eye. It is when the practitioner omits to think about glaucoma that its presence escapes him.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The patient shrinks from the slightest touch, and may say that his eye feels too big for its socket. On palpation it feels hard as a stone. The bulbar conjunctiva is congested and œdematous; the cornea is steamy and so insensitive that it can be touched without the patient's knowledge; the pupil is dilated, irregularly oval shaped and irresponsive to light; the anterior chamber is shallow and sight is seriously impaired.

At this stage of the examination the practitioner must be on his guard not to misinterpret the significance of these signs and symptoms. The hardness of the eye, the dilated pupil, the shallow anterior chamber, and the loss of sight ought to be sufficiently diagnostic to prevent acute glaucoma from being mistaken for any other disease. Unfortunately, however, the unwary frequently confuse glaucoma and iritis, with deplorable results. It is common knowledge that in iritis the vigorous use of atropine is imperative; but it is not so well known as it ought to be that if a mydriatic be instilled into an eye suffering from glaucoma the symptoms will be so gravely aggravated that the prospects of recovery are very materially lessened. Few errors in diagnosis and treatment are followed by such disastrous results. The subject is so important that repetition may be excused, and to sum up briefly let me say:—

(1) When the family practitioner is summoned to an urgent case, in circumstances such as have just been described, he ought always to bear glaucoma in mind, and be quite sure he has excluded that disease before he commits himself to any other diagnosis.

(2) Until it is certain that there is nothing wrong with the eye, the possibility of acute biliousness or migraine being the cause of the attack ought never to be considered.

(3) While retching and vomiting are usual accompaniments of acute glaucoma, these symptoms are so exceedingly rare in iritis that their presence should be sufficient to put the practitioner on his guard and make him examine the eye with great care. If he does so he will never confuse glaucoma with iritis.

After he has made a diagnosis the practitioner need not have much difficulty about the treatment. As a result of the increased intraocular pressure the patient is suffering agony and rapidly losing sight. The indications for treatment are to relieve pain and to contract the pupil. Morphia, our sheet anchor in so many emergencies, is invaluable in acute glaucoma. It should be given in full dose by hypodermic injection, and its sedative action can be assisted by fomentations and by leeching. It is also very important to get the bowels to move freely as soon as possible, and nothing is more effective than calomel followed by a saline draught. To contract the pupil and to reduce the tension of the eye the most convenient remedy is eserine 1 per cent. solution, repeated every two hours. The patient should be kept warm in bed and encouraged by the hope that the symptoms will be relieved after a sound sleep. Although it is wise to speak to the patient in a very reassuring manner, the practitioner, before he leaves the house, ought to tell the relatives that the condition of the eye is serious, and to warn them that on the following day an operation may be necessary. Sleep is Nature's cure for glaucoma, and if the patient has had a good night the eye will probably be much better when he wakens in the morning. If, at his morning visit, the practitioner finds the pain relieved and the pupil contracted he can safely continue the treatment; but if, on the contrary, he finds the general symptoms acute and the pupil dilated he should not hesitate to ask for a consultation with a specialist. He cannot accept responsibility for delay. The circulation of the intraocular fluids has become strangulated; and, if the increased pressure be not relieved promptly, serious impairment of sight, terminating in many instances in blindness, will inevitably result. The hopelessness of the situation can, however, be removed by operation provided action be taken in time. The state of the eye in acute glaucoma has been compared to a strangulated hernia. The analogy is apt, and if it be remembered the family practitioner will never on his own responsibility counsel delay because he will readily understand that relief to strangulation is as imperative in the eye as it is in the bowel.

The Methods of Investigating a Urological Case.

By C. A. R. NITCH, M.S., F.R.C.S.

The Practitioner, April, 1929, Vol. CXXII, p. 205.

The great advance in diagnostic methods in recent years has been the most important factor in elevating urology to the precise and accurate science it has now become. A correct diagnosis can be made only by obtaining a full and complete history, by making a careful note of the relevant facts and following this by a thorough general and local examination, and when necessary by urethroscopy, cystoscopy and radiography as well.

The modern student is taught to regard urology as an exact science and to tackle its many problems by scientific methods. The majority of the profession have also come to realize and value the methods of making an accurate diagnosis which are now at their command, but there are still some who, for example, treat cystitis empirically from the outset instead of ascertaining its cause by the aid of microscopy, bacteriology and cystoscopy. Oxaluria, the colon bacillus, and a foreign body in the bladder all produce more or less similar symptoms which can be relieved temporarily by drugs, but the problem can only be solved by scientific means. Again, a patient with hæmaturia is still too often treated immediately with hæmostatics instead of being subjected to a searching examination with the object of ascertaining the exact source and cause of the hæmorrhage. A papilloma of the bladder, when small, can be destroyed with one touch of the diathermy electrode; but if the painless hæmaturia which is its only early symptom is treated medicinally, the growth will have increased and probably also multiplied by the time the practitioner realizes that his favourite drug has failed him.

Vaccines are often of great value, but they are quite useless when administered to a case in which the exact cause of the infection has not been discovered.

In every disease diagnosis is the key to treatment, and in a urological case this key can only be fashioned by a preliminary methodical examination based on a formulated plan. The greater part of this examination lies easily within the scope of the general practitioner and can be carried out without any special instruments; when completed he will be in a position to decide on the necessity or otherwise of further instrumental investigation.

Plan of Examination.

(1) Nature of complaint.
(2) Family history and past history.
(3) The symptoms and their method of onset.
(4) General examination.
(5) Local examination.
(6) Examination of the secretions and excretions.
(7) Instrumental and radiographic examinations.

(1) Nature of Complaint.

The patient should be allowed to state in his own words, the nature of his complaint and the important short signs and symptoms he has noticed. Do not cut him short unless he is unduly loquacious, for valuable information is sometimes concealed in a mass of verbiage.

(2) Family History and Past History.

Inquiries should be made regarding the health, age and, if not alive, the cause of death of all near relatives, particular attention being paid to syphilis, tubercle, lithiasis, diabetes, Bright's disease and mental and nervous disturbances. Also the possibility must not be overlooked of contagion from syphilis, gonorrhœa or tubercle in a member of the family living in the house.

It is important to ascertain if the patient has lived abroad and suffered from any illnesses peculiar to the district. Bilharziasis is endemic in Egypt and certain parts of Natal; lithiasis and "gravel" are common in India, and hydatids in Australia.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The age of the patient has an important bearing on the diagnosis, as certain lesions of the genito-urinary tract are peculiar to the three main periods of life.

In infancy and childhood one must be on the lookout for congenital malformations and their effects, for vesical calculus and microbic infections. Renal tuberculosis is by no means uncommon but is often associated with gross lesions in other parts of the body. Pyuria in children which does not soon respond to treatment requires careful investigation, for it may be due to congenital stricture of the urethra, to the persistence of valvular folds in the prostatic urethra, to vesical calculus, or to stenosis of the ureter producing pyoureter and pyonephrosis.

As age advances renal tuberculosis becomes increasingly common and, in addition to the many other diseases of the urinary tract, the effects of the gonococcus on the urethra, prostate and seminal vesicles come into prominence. In old age, enlargement of the prostate, vesical calculus, malignant disease and the consequences of urethral stricture claim priority.

Careful inquiries should be made regarding any acute illness the patient may have had as a child, particularly the specific fevers, for they are often followed by nephritis. Orchitis and oophoritis occur as a complication of mumps more often in the adult than in the child.

Any venereal history must carefully be investigated both as regards the form of the disease and the method and duration of treatment. Energetic irrigation may have driven a gonococcal infection into the prostate and seminal vesicles, where it lies more or less dormant for years but always ready to light up and cause puzzling symptoms when given the proper stimulus. An inflammatory urethral stricture is often long in following its cause. It is hardly necessary to point out that a negative Wassermann reaction is of no value and that the spirochæte may suddenly wake into activity as long as twenty years after the original infection.

Inquiries should be made into the habits and occupation of the patient, his relaxations, and his indulgences in food and alcohol, for all these details have a bearing both on the condition of his arteries and his kidneys and his suitability for a possible operation. The man of sedentary habits and city dinners requires careful investigation and treatment before a serious operation such as prostatectomy. Some, from either nervousness, necessity or habit, refrain from emptying the bladder for many hours, with the result that it becomes permanently overdistended and never empties properly. Such a bladder readily becomes the seat of a chronic and incurable infection. In women the urinary history during pregnancy and the puerperium should be elicited.

When the family and past histories have been obtained the patient should be allowed to describe his symptoms in detail, their onset and their course.

(3) THE SYMPTOMS AND THEIR METHOD OF ONSET.

The symptoms as described by the patient are often very unreliable and may confuse the examiner by drawing his attention from some important detail which the patient regards as trivial, but they are of great value when used as indicators to judicious questions and proper physical examination. In some instances the symptoms are typical and frankly diagnostic; while in others they may be misleading, as, for example, urethral pain and strangury which focuses the attention of both patient and surgeon on the bladder when the real cause is either uterine displacement, hæmorrhoids, a pelvic appendix, a calcified tuberculous gland irritating the nerves of the bladder, or prolapse of the bladder wall through one of the hernial rings. Again, renal pain is sometimes referred entirely to the healthy kidney, particularly in tuberculosis and calculus, or it may be referred to some part of the abdominal wall and accompanied by such acute intestinal symptoms that the actual pathological condition is entirely missed. The chief symptoms and signs described by the patient will be either pain, a swelling, a urethral discharge, or disturbances of micturition and changes in the appearance of the urine.

Pain may be local or referred; when local and stationary it is always indicative of some pathological change; when referred it generally requires careful and often special investigation to make certain that it originates in the genito-urinary tract. Certain types of pain are peculiar to different parts of the genito-urinary tract and are best described according to their site and origin.

Urethral pain during micturition is due to inflammation; *before* micturition, to obstruction from a stricture, a stone, a foreign body or a growth. Referred pain *along the urethra occurs* both during and at the end of micturition in cystitis and is generally described as scalding. Pain at the tip of the penis is usually caused by irritation of the vesical neck and sometimes by a stone impacted in the lower end of the ureter, but it may be due to inflammatory and other changes in the posterior urethra, prostatic calculi and malignant disease.

Perineal pain, if not of anal or rectal origin, is strongly suggestive of an inflammatory or other lesion of either the prostate, the posterior urethra, the seminal vesicles or the base of the bladder.

Groin pain is generally due to inflammation of the cord or testis, but is sometimes felt in carcinoma of the prostate, in prostatitis and spermatocystitis.

Suprapubic pain is seldom a pronounced symptom in urinary diseases, but is sometimes present in carcinoma of the prostate, in chronic cystitis with distention, and when the upper part of the bladder is the seat of an inflamed diverticulum. It may be referred from a distance, and in one case was the sole symptom of a gall-bladder packed with stones—a problem that was only solved by abdominal exploration after an exhaustive examination of the urinary tract.

Renal and ureteric pain are characteristic when local and associated with symptoms peculiar to the conditions from which they arise, but when referred they may be very misleading. I once saw a man who suffered from attacks of sudden agonizing pain located precisely to the upper end of the scar of a herniotomy wound accompanied by exquisite tenderness at the same spot. There were no other symptoms of any kind. A skiagram of the kidney revealed the cause in a spiked oxalate calculus.

Renal pain is generally located to a triangular area having its base along the erector spinæ between the last rib and the crest of the ilium and its apex at the lower border of the ribs anteriorly. From this triangular area the pain may be referred along the course of the ureter to the inguinal region, the testis or labium, the urethra, the anterior part of the thigh and leg and the heel. Occasionally it is referred to the opposite healthy kidney, the diseased one being painless. Tenderness in the angle between the last rib and the erector spinæ is typically renal.

Ureteric pain is either felt along the line of the ureter or is referred to the groin and testis or labium. When the lower end of the ureter is implicated the pain may be felt at the base of the bladder, along the urethra, at the external meatus or in the perineum. Renal and ureteric colic are generally accompanied by muscular rigidity, vomiting and abnormal intestinal movements, and may simulate acute appendicitis or intestinal obstruction. If it be remembered that the patient with colic rolls about in agony and the patient with an acute abdomen keeps still, a mistaken diagnosis is not likely to occur.

Another diagnostic aid of great value is Rovsing's sign. This serves to distinguish between a renal and an acute intraperitoneal lesion on the right side. It is elicited by firm massage of the descending colon with the flat hand; if this causes pain in the right iliac fossa it signifies localized peritonitis, usually due to acute appendicitis; if, however, the massage does not cause pain in the right iliac fossa, the lesion is probably renal or ureteric, but may be intraperitoneal. A renal or ureteric affection will be confirmed by tenderness on pressure in the angle between the last rib and the erector spinæ. The great value of this sign is well illustrated by the following case:—

A boy of 14 had severe pain in the right side of the abdomen and muscular rigidity suggestive of acute appendicitis, but he also had frequency of micturition, pyuria and swarms of *B. coli* in the urine; there was

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

slight tenderness in the costo-muscular angle. Was this a case of acute pyelitis only, or of pyelitis complicated by acute appendicitis? Rovsing's sign was positive and was the deciding factor for an immediate operation, when a perforated gangrenous appendix was found adherent to the ureter at the brim of the pelvis.

Pain at the end of micturition accompanied by an intense desire to urinate is again typical of cystitis and trigonitis. A pricking pain referred to the external meatus suggests a vesical calculus or foreign body, especially if aggravated by movement and change of position. Severe shooting pain in the bladder and urethra may be due to organic disease of the spine or the central nervous system. Renal pain relieved by recumbency and either relieved or increased by change of position points to a mobile kidney, a renal tumour, intermittent hydronephrosis and horse-shoe kidney.

Disturbances of micturition figure largely in urological cases and must be subjected to detailed inquiries after the patient has described the chief peculiarity. He should therefore be asked about abnormal frequency (pollakiuria), urgency, excessive or diminished secretion (polyuria and oliguria), and painful or difficult micturition (dysuria).

Alterations in the urinary stream and loss of power occur in obstruction at the neck of the bladder and in the urethra, and in diseases of the nervous system. When sudden, it is generally due to an impacted stone or portion of growth; when gradual and progressive, to enlarged prostate, stricture or tabes.

Frequency of micturition in general may be due to habit; to changes in temperature, especially in those who have lived in the tropics; to nervousness; to the polyuria of diabetes, chronic nephritis; and diuretics such as tea, coffee, alcohol, etc.; to irritating conditions of the urine produced by blood, by the sudden discharge of pus from an infected kidney or perivesical abscess, by drugs and by oxalates, phosphates and uric acid crystals; to diminished capacity of the bladder by pressure from without, or by inflammation of its walls and lining membrane; to stone, new growths and foreign bodies, in all of which cystitis is the usual cause of the frequency; to diseases of the prostate, seminal vesicles and posterior urethra; to hernia of the bladder, cystocele and uterine displacements; and reflexly to worms and other anal and vulval sources of irritation.

Though frequency often occurs in nervous diseases it is seldom pronounced in tabes, the disease in which the bladder is most often affected. There may be slight initial frequency and urgency, but generally there is progressive loss of power with diminished desire to micturate, ending in sudden complete retention or incontinence from overflow.

Frequency may be diurnal, nocturnal or both. *Diurnal* frequency occurs in nervousness and sexual neurasthenia, in vesical calculus, and in *mild* inflammation of the bladder, prostate and urethra. *Nocturnal* frequency is pronounced in enlarged prostate, renal tuberculosis and severe cystitis and prostatitis. *Frequency by day and night* is due to acute inflammation of the lower urinary tract (cystitis, prostatitis, posterior urethritis, etc.), to reflex irritation such as worms, and to organic polyuria. *The frequency of enlarged prostate* is characteristic. Though present during the day it is not sufficient to attract attention. At night the patient sleeps for several hours and then wakes to urinate at more or less frequent intervals till he rises in the morning. *Frequency* and *urgency* indicate irritation of the posterior urethra and vesical neck.

Dysuria is symptomatic of obstruction or atony. The commonest obstructive causes are stricture, diseases of the prostate, impacted calculi, chronic inflammatory thickening of the vesical neck and congenital malformations. It is useful to remember that the patient with a stricture strains throughout micturition, with a vesical calculus at the end and with enlarged prostate at the beginning.

Painful micturition denotes inflammation or irritation of the urethra and bladder.

Oliguria is a symptom of cardio-vascular and organic renal disease.

The patient must next be asked if any changes in the appearance of the urine have been noticed and how and when they have occurred. The chief abnormal constituents are pus, blood and crystals.

Pyuria.—Pus in lumps and flakes at the beginning of micturition comes from the urethra or prostate; if, in addition, a further quantity is voided at the end of micturition it is almost certainly from the prostate or seminal vesicles. Purulent urine is passed in all varieties of cystitis, and is generally accompanied by terminal pain, but pus from the kidneys may be passed in large quantities without any symptoms of cystitis. An intermittent purulent urine indicates sacculus of the bladder, perivesical suppuration, obstructive pyonephrosis, or that form of renal tuberculosis which is alternately open and closed. In the aged, sudden apyrexial cystitis with its accompanying pyuria is very suggestive of vesical carcinoma.

Hæmaturia.—As the patient will naturally ascribe any red coloration of the urine to blood the practitioner should inquire carefully into its character, possible cause, onset, duration, presence of clots, etc., and should bear in mind the possibility of the pigmentation being due to hæmoglobinuria or to excessive indulgence in sweets stained with eosin. He should ask if the patient has resided in any part of the world in which bilharziasis is endemic; also realizing as he does the innumerable causes of hæmaturia, he must endeavour to eliminate by appropriate questions such causes as hæmophilia, purpura, scurvy, chronic nephritis, arterio-sclerosis, foods or fruits causing oxaluria, and medicines containing hexamine.

Blood from the kidney is usually intimately mixed with the urine and gives it a brown or red tinge; blood from the bladder is generally bright, and on standing forms a red precipitate at the bottom of the glass.

Hæmorrhage at the commencement of micturition is from that portion of the canal in front of the compressor urethræ; terminal hæmorrhage may come from the posterior urethra, the verumontanum, the prostate, the seminal vesicles, or from a papilloma at the internal meatus.

Painless hæmaturia of *sudden onset* in a young subject may be due to rupture of a renal arteriole, in an older patient to arteriosclerosis or Bright's disease. In some cases of chronic interstitial nephritis hæmaturia is the initial symptom and may be so profuse as to endanger life. Painless *intermittent* hæmaturia is characteristic of papilloma of the bladder. Constant slight hæmorrhage is very suggestive of vesical carcinoma.

Hæmorrhage due to oxalates and uric acid is sudden in onset and usually accompanied by renal pain, but sometimes only by slight irritation of the bladder. The association of sudden hæmaturia with lumbar pain generally signifies a renal origin, but this is not always the case, for ureteric calculus or a papilloma at the vesical orifice of the ureter can cause identical symptoms.

Profuse renal hæmorrhage without previous symptoms of stone occurs in papilloma of the renal pelvis, angioma of a papilla, surgical tuberculosis in which it is sometimes the first symptom, malignant growth and aneurysm of the renal artery.

From the foregoing it will be realized that the cause and source of hæmaturia can only be discovered by radiography and by the aid of the urethroscope and cystoscope, that these diagnostic aids should be employed as soon as possible, and that no operation should be performed until the site of the bleeding has been located by these means.

Crystals of calcium oxalate and uric acid, when unaccompanied by hæmaturia, will probably only attract attention by the irritation they cause, and in the case of uric acid by their colour. In some cases of phosphaturia the urine is cloudy only after meals.

Persistent haziness is generally due to colon bacilluria; occasional haziness combined with frequency in a young adult is very suggestive of renal tuberculosis.

(4) GENERAL AND (5) LOCAL EXAMINATION.

The appearance and bearing of the patient will already have been noticed, but special attention should now be paid to the complexion, the mental attitude, and to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

signs of wasting or dehydration. The tongue should be inspected and the mouth examined for septic foci. The patient must be questioned about his appetite and desire for fluids. The blood-pressure should be taken and the condition of the arteries noted. The knee jerks and pupil reflexes should never be omitted, for the number of cases that have been operated on from neglect of this simple precaution is by no means negligible. The chief clinical signs of a defective renal function are thirst, disinclination for food, particularly meat, a dry tongue and a sallow complexion. In my opinion these signs are often more valuable than chemical tests, and therefore particular attention should be directed towards them. The hernial regions should next be inspected, and the heart and lungs examined if necessary.

The patient then lies on a couch and the whole abdomen is carefully palpated. If the bladder is distended (and whenever possible the patient should always be told not to pass urine before examination) the patient should empty it as completely as possible, provided the symptoms do not point to the urethra or prostate when either the three-glass test or an estimation of residual urine will be required at a later stage. After micturition, palpation will show if the bladder has been more or less completely emptied. The kidneys are then carefully examined bimanually, and any abnormalities in their position, mobility, size, shape and sensitiveness noted. The presence or absence of tenderness on pressure in the angle between the last rib and the erector spinæ should be tested. The inguinal glands should be examined, for amongst other regions they drain the urethra, penis and skin of the external genitals; they are sometimes enlarged, and often hard and shotty in established carcinoma of the prostate. The lymphatics of the testicles enter the iliac and lumbar glands; enlargement of them will have been detected in a thin patient during the abdominal examination.

The external genitals must now be carefully inspected and examined. A malignant renal growth sometimes gives rise to a varicocele which differs from the common variety in not disappearing with recumbency. Gross malformations and variations in size and shape will be detected easily, but lesser developmental defects and pathological lesions may require a careful search. The external meatus should be inspected with a view to noting both its size and the presence or absence of a discharge. A discharge may be profuse and obvious, or scanty and only rendered visible by massaging the urethra or by scraping it gently with a platinum loop. In every case a smear should be made for microscopical examination. Thickening along the course of the urethra is characteristic of long-standing stricture or of a peri-urethral abscess in connection with it.

If the scrotum be devoid of a testis the perineum, groin, inguinal canal and pelvis must be carefully searched, for the examiner should not be content until he has located the missing organ.

A scrotal swelling should be tested for translucency. Primary or idiopathic hydroceles are generally large, secondary hydroceles are always small. Special attention should be paid to the epididymis, and if there is any nodulation, thickness or enlargement the vas should be examined and later the prostate and seminal vesicles. Thickening of the globus major alone may be due to an encysted hydrocele of the epididymis (spermatocele) or to tubercle of hæmic origin. Enlargement of the globus minor is usually tuberculous or infective; when tuberculous it is generally secondary to a focus in the seminal vesicle or prostate, which in turn may be secondary to renal tuberculosis; when infective it is due either to urethritis or to prostatitis and vesiculitis.

The patient is now told to pass into an empty specimen glass all the urine he can, but if his predominant symptoms have been urethral or prostatic the three-glass test should be carried out. Urine is passed in a continuous stream into two glasses, one after the other, taking care not to empty the bladder. The prostate and vesicles are then massaged and the bladder emptied into a third glass. Glass No. 1 contains the washings of the whole urethra, glass No. 2 contains the bladder urine, and glass No. 3 contains bladder urine together with normal and abnormal secretions squeezed out of the prostate and vesicles. A smear can easily be made from the urethra and from deposits in the urines, and either sent to a pathologist or stained with carbolthionin and examined at once if the practitioner possesses a 1/12 inch oil immersion lens. Intra- and extra-cellular diplococci, stained deep blue, are almost certainly gonococci; but should it be important to confirm this the slide, together with a fresh smear if possible, should be sent to a pathologist for decolorization and Gram-staining.

The practitioner cannot be too careful or cautious in investigating the cause of urethritis in an adult and in making notes and preserving documents relating thereto. In females the cervix should be inspected through a speculum, and discharge from it examined microscopically. When the history and symptoms point to simple prostatic obstruction a gum-elastic bi-coude catheter is passed immediately after the bladder has been emptied naturally, in order to ascertain the amount of residual urine if any.

The male patient is next placed in the genu-pectoral position and the anus carefully examined for piles, excoriations, etc. A rectal examination which should be bimanual, is then made with a well-lubricated gloved finger. Having first ascertained the presence or absence of internal piles and any growth or abnormality of the rectum, the prostate is carefully palpated. In young men it is sometimes so soft and thin that the back of the pubis is felt with hardly any intervening tissue, and at first touch gives the impression that a hard prostate is being palpated; but the absence of steep sides to the lateral portions makes the diagnosis easy, and if there is the least doubt it can be cleared up at once by another rectal examination after the passage of a catheter.

The prostate should be carefully examined for mobility, elasticity, hardness or softness, nodules or diffuse thickening, and local or general tenderness. The definition of the margins of the lateral lobes, the presence or absence of the vertical interlobar sulcus, and the mobility or attachment of the overlying rectal mucous membrane must also be investigated.

The normal adult prostate is felt as a slight, smooth, moderately movable prominence covered by freely movable rectal mucous membrane and separated into two lateral lobes by a shallow vertical median sulcus. This sulcus becomes deeper in benign senile enlargement involving the lateral lobes, but, of course, is not altered when the enlargement is mainly intra-vesical; it is usually obliterated in malignant disease.

The chronically inflamed prostate is firm, only slightly movable, and generally has some tough nodular inflammatory deposits in one or both lateral lobes. Hard nodules surrounded by more or less normal prostate are very suggestive of tubercle and quite characteristic if the epididymis is also affected. A single calculus is difficult to diagnose by touch alone and requires confirmation by *x*-rays; but multiple calculi, which are usually small, can be rubbed on each other and feel like grains of uncooked rice in a bag. An abscess is tender and is felt as a soft area in the midst of the generally enlarged tough prostate. Pressure may cause a sudden gush of pus from the urethra. The malignant prostate is seldom much enlarged and is sometimes quite small; it is stony hard, irregular and nodular, and firmly fixed. The median sulcus is absent and the sulcus generally felt at the edge of the normal lateral lobe is replaced by a firm flat band apparently joining the prostate to the pelvis. This band is composed of lymphatics and cellular tissue infiltrated with carcinoma cells. Occasionally the infiltration can be felt spreading upwards on the posterior wall of the bladder. The examiner should remember that carcinoma of the prostate gives rise to early metastases in bones, favourite sites being the lumbar and sacral vertebræ and the pelvis, and so whenever possible he should have these regions *x*-rayed. Occasionally the primary growth is "slight," and the metastasis is the first indication of its existence.

Below the prostate on each side of the mid-line Cowper's glands can be felt, if enlarged, by grasping

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the tissues between the finger in the rectum and the thumb on the perineum. The seminal vesicles spread almost horizontally outwards from the upper border of the prostate. When healthy they can hardly be felt, even bimanually; therefore if they are palpable they are almost certainly pathological. The commonest causes of enlargement of the vesicles are chronic gonococcal infection and tubercle. In the former, pus casts and infected fluid can be expressed by massage, but they are not obtainable in the latter as the thickening is due to caseation and fibrosis.

Hæmatospermia is a common symptom of tuberculous vesiculitis, but also occurs in chronic inflammation of the verumontanum. In a thin subject it is possible to feel a stone in the lower end of the ureter, pressure often causing a pricking sensation along the urethra. A thickened ureter can sometimes be felt bimanually in both male and female, and when discovered is almost pathognomonic of renal tuberculosis.

(6) EXAMINATION OF THE SECRETIONS AND EXCRETIONS.

The apparatus required for consulting-room examinations consists of a microscope with a 1|6 inch and a 1|12 inch oil immersion objective, a movable stage, a platinum loop, a small bottle of carbol-thionin or methylene blue, slides and cover slips, and the usual reagents for testing urine.

When the patient complains of a urethral discharge or a gleet, a drop is collected from within the urethra with a sterile platinum loop and a thin smear is made on a slide. This is dried, stained for a few minutes with carbol-thionin, washed with tap water, dried by heat and examined with a one-twelfth objective. Organisms are stained deep blue, and if they are diplococci and are both in and around the cells, they are certainly gonococci. If the discharge is very scanty the three-glass test is carried out and the debris stained and examined. Little masses of pus called "commas" come from the crypts of the urethra, thin long threads from the prostate.

If the urethra and prostate are not under suspicion a specimen of urine is collected in the ordinary way and submitted to the usual chemical examination. If there is any deposit or alteration in colour a drop should be placed under the microscope and examined with a 1|6 inch lens, when blood, pus, crystals, casts, cellular elements, bilharzia ova, etc., can all be seen and identified.

If motile bacilli are noticed they are almost certainly *B. coli* for they are the only ones that can be seen with such a low power. An acid, hazy urine containing pus cells may be due to colon bacilluria or tubercle, and should be subjected to careful examination by a pathologist. Uric acid and oxalate crystals are found in acid urine and can account for a small quantity of pus, but this cannot be accepted for a diagnosis, as both crystals and pus may be secondary to a stone in some part of the urinary tract.

Cloudy, alkaline urine may be due to phosphates, bacteria or pus. Phosphates sink to the bottom of the glass and dissolve on the addition of a few drops of acetic acid, whereas pus and bacteria are unaffected. Ammoniacal urine is due to decomposition of urine in the bladder occurring in chronic cystitis caused by obstruction or paralysis. Putrid, alkaline urine may be due to the same cause, or to a vesico-intestinal fistula, or a necrotic vesical growth, but it may also come from a pyonephrosis in which there is a large quantity of pus and retained urine.

(7) INSTRUMENTAL AND RADIOGRAPHIC EXAMINATIONS.

If the history and symptoms point to a stricture, a metal urethral sound should be passed with aseptic precautions after rendering the urethra analgesic by injection of a few drachms of 5 per cent. novocain solution. A medium size is selected, say 18 F., as this is large enough to localize the stricture and blunt enough not to injure the urethra. The bladder sound is seldom used nowadays, its place having been taken by the cystoscope.

Urethroscopy and cystoscopy require special instruments and training, and therefore a description of these important methods of examination has been omitted. It should be realized, however, that practically every urological case may ultimately require one or both of these examinations together with a complete radiological examination. Urethroscopy is required for the diagnosis and treatment of chronic anterior and posterior urethritis, and for locating strictures, tumours, and abnormalities of the canal; it is always indicated in cases with perineal and urethral pain. The cystoscope is required to make and to complete diagnosis, and as a means of catheterizing the ureters and treating various prostatic, vesical, and ureteric conditions. Its use is indicated in every case of hæmaturia; in all inflammatory conditions of the bladder and kidneys, sometimes during but generally after the acute symptoms have subsided; in all cases of suspected stone, neoplasm, and foreign body; and in many cases of prostatic obstruction.

When the object of the cystoscopy is to discover the source of blood or pus or to ascertain the cause of obscure renal pain, or to localize shadows in the renal and ureteric regions, the examination must be carried out in a place where a good *x*-ray apparatus is available, for in order to elucidate the problem it will be necessary to catheterize the ureters, to take stereoscopic *x*-ray photographs, and to make pyelograms. My routine in these cases is as follows:—

The patient is given a good aperient 24 hours beforehand, to clear the bowel for radiography. One hour before examination 15 grammes of urea in 100 c.cm. of water are given by mouth on an empty stomach; this is used as a test of renal function and its diuretic effect also ensures a good flow of urine. As the patient must be conscious when the radiograms are taken, a general anæsthetic is not permissible; should the patient be temperamentally unsuitable for local analgesia, or should the bladder be very irritable, the cystoscopy and catheterization of the ureters can be carried out under gas oxygen anæsthesia. On introducing the cystoscope a specimen of bladder urine is collected in a sterile tube; the ureters are then catheterized and specimens of urine from each kidney collected in sterile tubes. The three urines are preserved for bacteriological and biochemical examination.

The patient is now placed on the *x*-ray table and stereoscopic radiograms taken of the kidneys and the pelvic portion of the ureters. The examination is completed with a pyelogram of each kidney.

When carried out in this way the bacteriology and cystology of the urinary tract is investigated, the course of abnormal deposits in the urines is discovered, the function of each kidney is estimated, all shadows in or near the urinary tract are localized, and the shape and size of the pelvis and calyces of the kidneys are ascertained. Further information can be obtained only by operation. In stricture cases a urethrogram is useful. It is made after the injection of 10 c.cm. of heavy lipiodol and shows up irregularities, periurethral abscesses, and false passages. A cystogram is useful in disclosing a diverticulum or an incompetent ureterovesical valve. In the latter the opaque fluid will distend the ureter and kidney as well as the bladder.

Notes on some Hæmatological and Serological Investigations in Leprosy.

By JOHN M. HENDERSON, M.B., CH.B. (Glas.),
N. K. DE, B.SC. (Cal.),
and
S. GHOSH.

(*The Indian Journ. Med. Res.*, January, 1929, p. 687.)

THE present series of investigations was undertaken with a view to determining whether any change directly attributable to leprosy could be detected in certain of the physical properties of the blood and serum and to correlate these changes, if possible, with the type and stage of the disease and the sedimentation rate of the erythrocytes.

(1) *Specific gravity of whole blood.*

For the determination of this property, the simple and relatively accurate method described by Rogers (1913)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

was employed. This consists in making up a series of mixtures of glycerine and distilled water so as to give a range of specific gravity from 1046 to 1064. Blood was drawn from the median basilic vein into a perfectly dry and sterile all-glass syringe and one drop quickly added to each of a series of test-tubes containing about 5 c.cs. of the glycerine-water mixtures of different specific gravities. The specific gravity of the blood is represented by the particular glycerine-water mixture in which the drop of blood prior to disintegration remains momentarily suspended in the body of the fluid. Simultaneous estimations were made and the final result was taken as the mean of the independent readings.

Thirty cases representing different types and stages of the disease were investigated.

Conclusions.—The type and stage of leprosy *per se* appears to have little effect on the specific gravity of the blood. Advanced types appear if anything, however, to be associated with a slight lowering of specific gravity.

There is some correlation between the sedimentation rate of the erythrocytes and the sp. gr. of the blood in that an increased sedimentation rate tends to be associated with a relatively low sp. gr.

(2) *Fragility of the Red Blood Corpuscles.*

This was estimated in the usual way by making up a series of solutions of NaCl in distilled water so as to give a range of concentrations of NaCl between 0.50 per cent. and 0.30 per cent., with a mean difference of 0.02 per cent. between any two adjacent solutions in the series. About 6 drops of blood obtained by finger-prick were received in a paraffin watch glass and of this 10 c.mm. were quickly transferred to each of a series of tubes containing the range of NaCl concentrations. Each tube was quickly inverted several times, the contents thoroughly mixed and the tubes set aside to stand for 30 minutes at room temperature. At the end of this period each tube was spun in the centrifuge for 5 minutes and the readings taken.

Twenty-eight cases representative of all types and stages of the disease were tested in this way. Without going into unnecessary detail it may be stated that we could find no very great variations from normal in the majority of cases. Any individual variations fell within the limits of experimental error.

(3) *Surface tension of Blood Serum.*

For the estimation of this property we employed a Traube Stalagmometer and in order to ensure uniformity of results particular attention was paid to the following points:—

(*a*) Cleanliness of the instrument. The presence of foreign matter and particularly of grease, profoundly alters the results. The instrument was carefully cleaned out with distilled water, absolute alcohol and ether and finally placed in the hot air steriliser, protected from dust, for half an hour.

(*b*) Uniformity in the size of drops. Marked differences in readings may result from differences in the size of drops. To eliminate this source of error so far as possible, the instrument was suspended vertically, its position being checked by the plumb line. The mouth of the stalagmometer was also carefully wiped with a clean cloth immediately prior to counting lest variations should arise consequent on partial drying of the column of serum immediately above the dropping orifice.

(*c*) Air bubbles were rigidly excluded from the column of fluid.

(*d*) Successive estimations were carried out at the same temperature:—37°C.

(*e*) All active treatment had been suspended for at least one week in the patients selected for experiment, lest alterations in surface tension might be caused by this factor.

Method.—In the absence of a regular thermostat we employed a bacteriological incubator regulated at 37°C. The stalagmometer was suspended vertically in the incubator and attached to its upper end was a long piece of close fitting rubber tubing which passed through a cork filling the thermometer opening in the roof of the incubator. The other end of the tubing was clamped and a centigrade thermometer suspended inside the incubator.

About 10 c.cs. of blood having been drawn from the median basilic vein into a sterile test-tube, the serum was separated from the clot and placed in a small clean glass vessel inside the incubator. Serum was then drawn up into the stalagmometer by suction through the rubber tubing until the upper level of the column of serum was just above the top mark on the stalagmometer. The column was then allowed to fall until the meniscus of the fluid reached this mark after which the rubber tubing was clamped. The vertical position of the instrument was checked and the column of fluid carefully inspected for air bubbles. The temperature having become steady at 37°C. the dropping orifice of the instrument was carefully wiped with a clean cloth, the position of the instrument again checked, the rubber tubing unclamped and the drops counted as the fluid fell between the heavy marks on the stalagmometer tube. The whole procedure was watched through the inner glass door of the incubator thus avoiding fall of temperature during the experiment. In all, 22 sera from different types of leprosy were examined and in both the reacting and non-reacting phases of the disease.

Our results may be tabulated as follows:—

(1) Surface tension of normal sera (mean of 56 observations)—63.3 dynes per cm.

(2) Surface tension of leprous sera (mean of 90 observations)—62.4 dynes per cm.

(3) Surface tension of "reacting" leprous sera only (mean of 42 observations)—62.4 dynes per cm.

It seems justifiable to make the following statements:—

(1) The surface tension of leprous sera is on the whole somewhat lower than that of normal sera tested under approximately identical conditions: but the difference is not one which can be regarded as having any clinical significance.

(2) The surface tensions of sera from cases in the quiescent and reactionary phases of leprosy are approximately the same.

(3) There tends to be a fall in surface tension with acceleration of the sedimentation rate of the erythrocytes.

SUMMARY AND CONCLUSIONS.

(1) Observations have been made on the specific gravity of the blood, the fragility of the red blood cells and the surface tension of the serum in leprosy cases.

(2) The type and stage of leprosy *per se* appear to have little influence on any of these phenomena.

(3) Cases of leprosy showing increase in the rate of sedimentation of erythrocytes tend to show also a fall in the specific gravity of the blood and in the surface tension of the serum.

The Microscopical Changes Occurring in Organs after Death.

By F. P. MACKIE, V.H.S., O.B.E.,
LIEUTENANT-COLONEL, I.M.S.

(The *Indian Journ. Med. Res.*, January, 1929, p. 827.)

IN our study of the changes in the intestine of sprue cases, we realized that some of the appearance we described might be due to, or at least were coincident with, those due to decomposition.

The importance of being able to recognize post-mortem change is a problem which confronts all histologists, but particularly those working in the tropics.

We set ourselves the task of observing such changes in orderly sequence and, as human material is not easy of control, we used the organs of monkeys. A healthy monkey was killed by chloroform and the intestinal canal, liver and kidney were removed *in toto* and kept in sterile dishes. Portions of the upper part of the small intestine, the lower part of the small intestine, of the large intestine, of the liver and kidney were removed after various intervals and placed in fixative for subsequent section. The intestines were not opened or washed out before fixation.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Summary of Findings.

The microscopical changes due to putrefaction as studied in the intestines, liver and kidney are discernible three hours after death at room temperature (75°F.) and proceed in an orderly manner as far as they have been followed (24 hours). The first changes are discernible in the epithelial cells of the kidney and of the intestine, and are of the nature of granularity of the cytoplasm, swelling and indistinctness of the nuclei and slight changes in tinctorial reaction. As putrefaction proceeds, the epithelial cells and the parenchyma cells of the liver gradually break up, lose their outlines, become hazy and eventually merge into an homogeneous mass. The nuclei first become swollen and vacuolated, lose their affinity for hæmatoxylin and eventually dissolve up. Muscle cells withstand the process longer but eventually show similar changes. The connective tissues retain their characters still longer and for this reason the general architecture of the organ is retained long after the parenchymatous cells have become diffluent or are dissolved.

Intestinal bacteria begin to penetrate the intestinal mucosa about nine hours after death and putrefactive bacteria are met with in increasing numbers after this time, and their distribution is generalized equally throughout the tissues suggesting that they have probably been carried there by the blood stream and not by invasion from a local site after death.

A Simple Method of Preserving Fæces Containing Hookworm Eggs.

By P. A. MAPLESTONE, D.S.O., M.B., Ch.B., D.T.M.
(The *Indian Journ. Med. Res.*, Vol. XVI, No. 3, January, 1929.)

OWING to there being a considerable loss of hookworm eggs from fæces kept in tins a method of preventing this loss is essential if accurate quantitative figures are desired.

The following method has been devised, and it has been found to keep hookworm eggs satisfactorily for at least three weeks under any climatic conditions.

Wide-mouthed bottles of about thirty cubic centimetres capacity are partially filled with twenty cubic centimetres of freshly prepared antiformin in water in a strength of 2 per cent., and they are tightly corked.

Small paper measures of four c.c. capacity are made in the following manner. The plunger of a ten cubic centimetres syringe is taken and a cylindrical rod of exactly the same diameter as the plunger is made of some hard wood. A circular mark is made on the wooden rod the exact distance from one end that four cubic centimetres, taken from the scale on the syringe barrel, covers. Strips of fairly stiff plain writing paper, that will not readily disintegrate in water, are cut; these are about ten mm. broader than the distance of the mark from the end of the rod. These paper strips are cut in lengths about five mm. longer than the diameter of the rod. A piece of this paper is rolled tightly round the wooden rod and the overlapping portion is gummed, forming a cylinder. The cylinder is put aside until the gum is dried, and it is then pushed on to the wooden rod until its edge reaches the circular mark. The projecting paper is now folded over against the end of the rod and the folded paper is held in place by a small square of gummed paper applied over the folds. This gives a paper tube of four cubic centimetres capacity.

A special box is made to hold the bottles in a given place, and to obviate the use of straw packing. The box has a false bottom about one inch above the true bottom and holes are cut in it to fit the bottles. A tray composed of two sheets of thin wood one inch apart is made, and in the upper sheet a series of holes similar to those in the false bottom are cut, to hold more bottles. A flange is placed round the inner walls of the box at such a height that the tray, when in position, will just touch the corks in the bottles in the bottom layer; the lid of the box is hinged and it is of such a height that it comes in contact with the corks of the bottles in the tray. The box is closed by a hasp and staple, and a padlock. The holes in the tray and in the false bottom are numbered, and a piece of paper, ruled to contain a number of spaces corresponding to the number of bottles in the box, and with columns for desired particulars, is fixed inside the lid of the box with drawing pins.

Fæcal specimens are collected in the field in the usual tin pill boxes with a piece of paper gummed on to the lid of each for recording particulars. On the same day that the stools are collected a paper measure is exactly filled from each tin and it is dropped into one of the bottles, and at the same time the particulars on the lid of a tin are copied on the sheet of paper in the lid of the box opposite the space corresponding with the number of the hole in which the bottle is placed. It is necessary to tie the corks into the bottles with a piece of twine, otherwise the pressure within the bottles generated by fermentation may so loosen them that they leak during transit.

On receipt at the laboratory the loose papers which were the measures are removed from the bottles with forceps and the bottle is well shaken to make an even suspension of fæces. Six cubic centimetres of this mixture is immediately poured into Lane's centrifuge tube, which has been previously marked with a diamond at the six cubic centimetres level, and this portion is subjected to Direct Centrifugal Flotation in the usual way. Negative bottles are discarded and the residue of the positive bottles is poured into flasks, and the bottles rinsed out with the requisite amount of N|10 sodium hydroxide to give the proper dilution by Stoll's method when it is added to the flasks.

The bottle originally contained twenty cubic centimetres of antiformin solution and four cubic centimetres of fæces, so that six cubic centimetres of this mixture contains one cubic centimetre of fæces, which is the optimum amount for D. C. F., and the remaining eighteen cubic centimetres of mixture contains three cubic centimetres of fæces, which is the correct amount counting by Stoll's method. Therefore, in addition to being preserved, the fæces are accurately measured at the time of collection, which is a great saving of time in laboratory.

This method has been used successfully on several hundreds of specimens. It is very cheap because, apart from the bottles, all the necessary apparatus can be made in the laboratory.

Value of Leucocyte Counts, according to Schilling Formula, in Clinical Medicine.

By F. W. NIEHAUS, M.D.
(*The Journ. Lab. and Clinic. Med.*, March 1929, Vol. XIV, p. 531.)

THE numerical and the differential leucocyte count is recognized as a valuable laboratory procedure; especially in infections it is regarded as an index of severity, and frequently is an important factor in deciding whether or not to perform a major surgical operation. But this measure is not always infallible, and often the leucocyte count does not furnish the anticipated information.

The method to be considered here has been found to minimize greatly these disappointments.

The first attempt to modify the conventional leucocyte count was made by Arneth in 1904, the chief point of which was a classification of the neutrophiles according to the nuclear morphology. His method was rather intricate, and too ponderous and time consuming for use in clinical medicine.

Cook modified this method, dividing the neutrophiles into five groups. This is a practical method, and furnishes as much information as the more complicated Arneth classification, and is still used by Ponder.

Schilling recently modified Arneth's method. His method is much simpler; in fact, with good preparations, it does not appreciably increase the time and labour of an ordinary differential, and markedly adds to its value. His classification of leucocytes is as follows:

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

1. *Myelocytes.*—The nucleus is round, oval, or kidney-shaped. It is relatively large, vesicular, and stains palely. It is coarsely granular, and usually has a nucleolus. The cytoplasm is pale blue. The granulations are usually delicate, and stain weakly. These are normally found in the bone-marrow, but never in the peripheral blood.

2. *Young Forms.*—Normally many are present in the bone-marrow, rarely in the peripheral blood. The nucleus is sausage or bean-shaped. It is vesicular, and does not stain intensely. There are granulations in the ends of the nucleus. The cytoplasm is like that of mature cells. At times it is distinctly light blue; the granulations are not so distinct. The cells are usually slightly larger than mature cells. This class is, in part, identical with Pappenheim's "metamyelocytes."

3. *Staff Forms.*—The nucleus is T, U, or V shaped. The cytoplasm is fully mature. These cells constitute 3 to 5 per cent. of the leucocytes of normal blood.

Degenerative staff forms are apparently mature neutrophiles without segmentation. On account of a developmental inhibition, the sausage form does not divide into segments. They are differentiated from the normal staff forms and the young forms by small band-like, often bizarre, twisted and always hyperchromatic (dark, structureless) nuclear forms. The granulations either easily overstain or stain feebly and are partially dissolved. These easily break in making smears.

4. *Segmented Forms.*—The nucleus consists of 2 to 5 unequal segments. The latter are united by fine threads. Broader unions (bridges) are temporary attenuations of the nucleus, which are influenced by technique and amæboid movements. Only the former are classified as segmented. About 67 per cent. of these are present in normal blood.

The other forms of granulocytes are the *eosinophiles* and the *basophiles*. Cells ordinarily classified as small lymphocytes are the only cells recognized as *lymphocytes*. Those white corpuscles which are usually classed as large lymphocytes, and the transitional cells, are called monocytes. The monocytes are described as at least twice the size of a red blood cell, usually much larger than a granulocyte. The cytoplasm is relatively wide, stains smoky blue to pale violet, and it frequently contains small vacuoles. The nucleus is of a medium size, or relatively large. Its shape is oval, or bean-shaped; it is placed slightly eccentric; the wall is never entirely smooth. It may even be sausage-shaped, or have plump segments.

Schilling further conceives the origin of white corpuscles from three sources namely: the granulocytes from the bone-marrow; the lymphocytes from lymph glands, and lymphoid tissue wherever found; the monocytes from the reticulo-endothelial tissue. The peripheral blood picture reflects the functional status of these organs or tissues, as influenced by their disease, or by their response to exciting agents, as infection. This is further influenced by destruction of leucocytes so that two factors are at work, namely, productive and destructive.

With pyogenic infection there is a bone-marrow stimulation to increased production, and also an increased use of neutrophiles before they reach normal maturity. The greater the stimulus the less mature are the cells thrown into peripheral circulation. So that, first, the number of the staff forms, then the young forms, and even the myelocytes are found in circulating blood. Coincident with this influx of immature forms, the cells are used before reaching maturity. In classifying these cells according to the nuclear form and consistency, a marked difference in the nuclei is evident. This is designated nuclear deviation. These are usually written from left to right across a page (myelocytes, young forms, staff forms, segmented forms). As the number of cells belonging to the groups on the left is increased, this condition is referred to as deviation to left. Changes enumerated above are regenerative changes. Besides these some diseases and infections exert an influence primarily inhibiting bone-marrow. These are degenerative changes.

With this conception in mind, certain blood pictures indicate certain phases of disease or infection.

(*a*) Slight stimulations produce only minor changes with slight increase of staff forms.

(*b*) Moderate stimulus shows a few young forms.

(*c*) Strong excitants cause marked increase of the young and even parent forms (myelocytes).

Ordinarily, the leucocyte count is parallel with the severity of the infection, but with very grave infection a sudden fall may occur. In the latter instance the decrease might be interpreted as an omen of recovery but in reality would be the reverse. The correct interpretation would be evident by proper scrutiny of the individual cells. Undoubtedly many young forms would be present in the blood. This phase concerns only the neutrophiles. When this ends favourably, with a return of nuclear deviation to the right, and decrease of leucocytosis, there is an increase of monocytes. This denotes that the infection has been conquered. The healing phase is evidenced by a lymphocytosis. Eosinophiles also disappear from the blood in severe infection, and their reappearance is the earliest favourable sign. On the other hand, basophiles appear only with severe infection, when the defensive factors are losing ground, and disappear with earliest improvement.

In all cases of acute appendicitis, there is a significant increase in the number of the younger cells. Its value was particularly emphasized in the cases which have only a slight increase in the total number of leucocytes.

Only those cases of chronic appendicitis are included which showed definite chronic inflammatory changes histologically. These are chiefly characterized by a more or less increase of the lymphocytes.

With normal pregnancy the usual leucocytosis is partially due to an increase of the immature forms.

The changes with the acute respiratory infections were very irregular. Deviation to left was coincident with the onset of a pyogenic process, usually several days after onset of illness.

In acute mastoiditis there was usually a definite increase in non-segmented forms. In several cases with low total leucocyte counts the Schilling differential was particularly valuable.

Chronic focal infection is characterized by an increase of lymphocytes.

Acetylcholine as a Depressant.

(Abstracted from *The Prescriber*, April 1929, Vol. XXIII, p. 146.)

CHOLINE, or hydrocyethyl-trimethylammonium hydroxide, $(CH_3)_3N\ (OH).\ CH_2.\ CH_2\ OH$, is a base that has been isolated from numerous animal and vegetable tissues. Its main pharmacological actions are those of lowering blood-pressure and of stimulating intestinal peristalsis, both of which actions can be antagonized and controlled by atropine. These properties are possessed also, and in much greater degree, by its acetyl derivative.

Acetylcholine, $(CH_3)_3N\ (OH).\ CH_2.\ CH_2O.\ OC.\ CH_3$, is the acetyl derivative of choline. It occurs in small quantities in ergot, but as it is very readily hydrolysed it is usually absent from medicinal preparations of that drug. It has long been known to possess the properties of choline in a much more powerful degree; indeed the general impression has been that it was too poisonous for administration medicinally.

Careful investigations during the past three or four years, however, have shown that acetylcholine, when suitably administered, is not only safe, but is a valuable therapeutic agent. It is known that the depressant action of histamine is directed mainly to the capillaries, causing flushing of the skin by dilatation of these vessels; the action of acetylcholine, on the other hand, is confined to the arteries and arterioles. Its action as vasodilator was found to be 100,000 times as powerful as that of choline, while its toxicity was only three times as great.

So powerful is this vasodilator property of acetylcholine, that Krogh regards its action as that of a hormone; the presence of minute quantities in the blood serves, he thinks, to maintain, in conflict with

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

adrenaline, the requisite arterial tension throughout the system.

Further studies have revealed other details of its action. Subcutaneous injection increases the volume of the retinal artery in man. In very dilute solution it excites the uterus of the guinea-pig. It increases the tone of smooth muscle and stimulates intestinal peristalsis. It produces contraction of striped muscle, which is controlled by atropine. In most respects its action is directly opposed to that of adrenaline.

The form in which it is used is the hydrochloride, which is a white powder, very hygroscopic, and soluble in water forming a stable solution. It is administered by subcutaneous or intramuscular injection: intravenously it is dangerous, while orally it seems to have no action. The dose is 0.05 gm. the first day and 0.1 gm. the following day. If in ten days the results are inadequate, a dose of 0.2 gm. may be given twice daily, but usually the single daily dose of 0.1 gm. is sufficient.

The vasodilator property of acetylcholine being restricted to the arteries and arterioles, the drug is of use in those conditions in which its effect on the vagosympathetic equilibrium can be exerted. It is of value in Raynaud's syndrome, in gangrene arising from arteritis, and in troubles of a like nature. In ten or fifteen minutes after an injection the fingers recover their normal colour; this persists for twelve hours to three days. In arteritis with a tendency to stenosis it is often of considerable value, and in the many troubles and complications of arterial hypertension it frequently renders good service. Its action in dilating the retinal artery makes it useful in spasm of this artery. Profuse tuberculous sweats appear to yield to the influence of small doses, 0.01 to 0.02 gm. Acetylcholine holds promise of being of some value in angina pectoris and in lead colic, while its action on intestinal peristalsis suggests its use in habitual constipation.

Acetylcholine hydrochloride, synthetically prepared, has been put on the market in the form of ampoules containing 0.1 gm. of the dry salt; these are accompanied by ampoules each containing 5 c.c. of double-distilled water for its solution. The contents of one ampoule of the salt are dissolved in the distilled water for subcutaneous or intramuscular (not intravenous) injection.

A Study of the use of Parathormone in the Control of Menstrual Bleeding.

By E. ALLEN, M.D., F.A.C.S.,
and
H. C. GOLDTHORPE, Ph.D.

(*Amer. Journ. Obstetrics and Gynecology*, March 1929, Vol. XVII, p. 344.)

WE have been trying for the past two years to control excessive menstrual bleeding with the parathyroid hormone. The primary rationale of this treatment is based on the increased coagulability of the blood encountered in hypercalcæmia. Added to this was the possibility that hypodermic medication with the active principle of the parathyroids might indicate to us some of the relationship between the ovarian and parathyroid secretions.

Beginning with the work of Collip, investigators have noticed the production of hypercalcæmic states with the increased coagulability of the blood in laboratory animals, particularly dogs. This hypercalcæmic state in dogs is characterized by anorexia, hæmorrhage into the gastro-intestinal tract, and death. According to Collip, this danger may be imminent when a serum calcium of 15 mg. per 100 c.c. of blood is reached. Hueper has reported depositions of calcium in excess of normal in many important organs obtained from dogs in which this hypercalcæmic state has been maintained for some time.

As far as we have been able to ascertain no case has been reported of a fatality in the human nor has any one established a level of hypercalcæmia in man. In view of the experimental evidence and lack of established rules for dosage, we have had to be extremely careful in our experimental work on women.

It is difficult to evaluate clinical symptoms in different individuals, especially in women who are menstruating. Nausea, vomiting, headache, and a feeling of depression are a common accompaniment of the menstrual period. Therefore, we have discontinued medication in several instances where, if we had had the courage to continue, more definite results might have been obtained.

Method.

These experiments were conducted on a series of fourteen young women who complained of severe menorrhagia. All of them had been previously subjected, with only temporary if any results, to the usual hemostatic procedures, such as oxytocics, injection of foreign proteins, and operation. The foreign protein injections were given with the possibility in mind that the disturbance might be on an infective basis in spite of negative palpatory or operative findings. Eight of these patients had menstruated profusely from the beginning of their menstrual history. Subsequent observations are recorded in this paper on the four patients included in our preliminary report. Due to a change in services some of these patients have not been observed for the past nine months. However, the results include observations on most of them for at least three menstrual periods after all treatment had been discontinued.

Definite conclusions are hard to draw from such a small group of patients but we feel that the following points are of interest:

1. We obtained good results in five patients, fair results in six and poor results in three cases of severe menorrhagia treated with hypodermic injections of parathormone.
2. The optimum dosage seemed to be about forty units intramuscularly, given each day over a period of five days.
3. Most effective results were obtained by combining this medication with 120 to 180 grains of calcium carbonate or lactate by mouth per day.
4. Calcium levels bordering on the hypercalcæmic state were obtained only five times, and only by this combination.
5. Patients having this high blood calcium (13.24 to 15.5 mg. per 100 c.c. plasma) usually complained of some headache, nausea, and a rapid pulse. Bleeding ceased at these levels.
6. Intravenous injections of parathormone would seem to be contraindicated.
7. The same condition that cause the menorrhagia seems to predispose toward sterility.
8. Direct effect can be produced on the endometrium by radium and the ovaries, protected by the insertion of a lead screen through the cul-de-sac in patients where medication fails.

Acetylsalicylic Acid and Alkaline Citrates.

(Abstracted from *The Prescriber*, April 1929, Vol. XXIII, p. 144.)

A MIXTURE of acetylsalicylic acid and sodium citrate with caffeine in the form of tablets has been introduced in Germany under the name of Amigren. It is stated that the therapeutic action of such a mixture sets in more quickly and more intensely than that of plain acetylsalicylic acid: it is assumed that resorption begins in the stomach and that the passage from there to the small intestine is more rapid.

The opinion of a number of medical men regarding the therapeutic action of this mixture during a recent influenza epidemic was that it is a most excellent mixture for influenza. By its use the blood poison is eliminated quickly from the system. In this the potassium citrate plays a part, because the action is both diuretic and diaphoretic. The action is quicker than that of acetylsalicylic acid, the patient often saying that there was a marked improvement even after the first dose. Then a small dose—say 5 grains—gives better results than one or even two 10 grain doses of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"TRADE MARK NORMACOL" BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

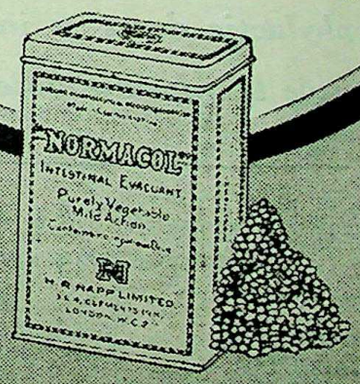
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H. R. NAPP LIMITED,

3 & 4, Clements Inn, London, W.C.2.

Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two Lines).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The Treatment of

Puerperal Septicæmia

In a recent paper (B.M.J., June 1st, 1929, p. 984) there is published a report showing that puerperal septicæmia, with hæmolytic streptococci, responds in a most remarkable manner to therapeutic doses of

RADIOSTOLEUM

Every case under treatment made a complete recovery.

This discovery is naturally of vital importance in obstetrics; indeed, the results indicate that its application in practice is likely to prove a most effective means of reducing substantially the maternal mortality rate.

It would appear that the natural sequence of the discovery is that Radiostoleum therapy will be found of inestimable value, throughout the pre-natal period, in building up a reserve of power to resist the onslaught of infection at the critical period.

Radiostoleum is a liquid which is issued in capsules and in bottles of varying sizes. It is administered

(1) In prophylactic doses — in capsules

(2) In massive therapeutic doses — by the teaspoonful

Literature containing particulars of dosage etc. will be sent on application to the B.D.H. resident representatives in India :

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Bldgs.,
Parsee Bazar Street,
Fort, BOMBAY.

THE BRITISH DRUG HOUSES LIMITED
LONDON

Vit.Pr./In/298.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

acetylsalicylic acid, and, finally, the patient does not complain of that washed-out feeling to the same extent.

The Intranasal Application of Insulin.

(Abstracted from *The Practitioner*, April 1929, Vol. CXXII, p. 267.)

THE writers have observed the effect on the blood-sugar in diabetics and in normal controls of insufflation of the nasal mucous membrane with a powder containing borax as a vehicle and varying quantities of insulin. Each powder of 25 to 30 mg. contained from 10 to 30 units of insulin. This powder was found to be quite non-irritant. Both in normal controls and in the diabetic cases a marked fall in blood-sugar took place within 2½ hours of the insufflation, thus proving that absorption from the mucous membrane of insulin had occurred. The writers do not suggest that this form of administration of insulin can replace that of subcutaneous injection in severe cases of diabetes which call for constant supervision, but they think that it may have a useful application in the treatment of the milder ambulant forms of the disease in which patients are at present allowed to give themselves the injections. The substitution of an intranasal administration for the often painful needle prick would be welcomed by these patients, and suitable dosages could, with care, be readily determined.—(H. Wassermeyer and A. Schafer. *Klinische Wochenschrift*, 29th January, 1929, p. 210).

Treatment of Neurasthenia.

(Abstracted from *The Practitioner*, April 1929, Vol. CXXII, p. 264.)

THE writer is of opinion that physico-therapy is not of much value in the treatment of true neurasthenia; neither hydrotherapy, electricity, nor heliotherapy have been found of benefit, in his experience. In neurasthenic dyspeptics bicarbonate of soda is contra-indicated, and magnesium oxide, with bismuth, is to be preferred; in some cases, dilute hydrochloric acid is of great benefit, given before meals, in water. Constipation should be combated by mild laxatives, such as psyllium seeds or liquid paraffin. The glycerophosphates are among the best drugs to employ in the treatment of neurasthenia, and the following prescription may be found useful:—

℞

Magnes. glycerophos.	..	cg. 25 (grs. iv.)
Pulv. valerian ..	..	cg. 10 (grs. j. ss.)
Pulv. belladonn. ..	..	mg. 5 (grs. $\frac{1}{12}$)

Sig. For one cachet; to be taken twice daily before meals.

Strychnine should never be given to true neurasthenics; and opotherapy is of little benefit, except that extract of the suprarenal is helpful to patients who are very depressed; it is best given in the form of the fresh gland, powdered, in capsules.—(R. Benon, *Journal des Practicians*, 9th February, 1929, p. 89).

Medical Research in 1928.

(*The Prescriber*, Vol. XXIII, April 1929, p. 121.)

(CONSIDERABLE interest has been aroused by the report of the National Research Council on the therapeutic value of artificial light, and considerable indignation has been evinced in certain quarters, but the following, taken from an editorial in the *Prescriber*, appears to be a fair statement of the case.—ED., *I. M. G.*)

Considerable attention is given in the report on medical treatment by artificial ultra-violet light, which is now being advocated and used in a great variety of disorders. Some part of this new use of light has, the Council says, an indisputable scientific basis. It is now established that irradiation of a particular sterol known to exist in the fat of the skin actually produces the vitamin D which repairs the food deficiency of which rickets is one of the most obvious signs. But there is no scientific reason to suppose that the treatment of rickets is better effected by irradiation of the skin than by the direct provision of the necessary food values. The use of artificial light to supply what the right food can give is merely wasteful: the same effect obtained from ultra-violet light at a cost of three or four shillings can be secured from cod-liver oil for less than a penny. As a substitute for the missing sunshine in our cities, ultra-violet irradiation is not very warmly supported by the Council. Trials among school children in London and elsewhere have yielded very contradictory results, and the general conclusion is that the power of resistance to minor ailments was not in any way increased, nor was the general health of the children improved by simple treatment with ultra-violet light. No objective evidence is provided, it is said, that results have been achieved which could not have been far more cheaply gained by proper food, and it appears that exercise and fresh air are greatly preferable to indoor sessions around a lamp. It has been definitely shown that ultra-violet irradiation, when it has caused a certain inflammatory reaction of the skin, does cause an increase in the bactericidal power of the blood, but this increase has not yet been correlated with any permanent effects of value in the body. Indeed there is no reason to suppose that artificial light does more than produce a certain counter-irritation, such as a mustard plaster produces at much less cost. Considerable work has been done with ultra-violet light in the treatment of superficial infections, but beyond a certain curative effect in the case of corneal ulcers the Council are unable to find evidence of any good results that cannot be obtained by simpler and less expensive treatment, and the expenditure of public money upon expensive installations is strongly deprecated. At the same time the Council believes in the effectiveness of natural sunlight, especially in surgical tuberculosis, though it is admitted that in such treatment other influences are bound to come into play.

Electrocution from Electrical Apparatus.

(Abstracted from *International Med. Digest*, Vol. XIV, March 1929, p. 192.)

A CASE was recently reported in which a young man was found dead in a bath with an ultra-violet ray lamp beside him. Death was attributed to shock, and an electrical expert, who examined the lamp at the request of the coroner, gave evidence to the effect that there were five ways in which an electric shock might have been sustained from the apparatus. The deceased had purchased the lamp in order to treat himself for blackheads on the back of the neck.

Another case was reported where a mischievous young boy electrocuted his younger sister by throwing an extension cord on which there was a lighted bulb into the bathtub in which she was bathing.

The fact that informed electricians invariably install fixtures in a bathroom with glass or china sockets or properly insulated chain pulls, is evidence of the fact that it has long been realized that water and electricity are extremely dangerous when they get together.

Reviews.

THE MEDICAL ANNUAL, 1929.—Bristol: John Wright and Sons, Ltd. 1929. Pp. 771, with many text illustrations and 71 plates (plain and coloured). Price 20s. net. Postage 9d.

FOR the medical man who has not access to a medical library and also abundant time to spend in that library, there is no better investment than the *Medical Annual*. It is far more than a mere epitome of the recent papers on any subject, it is a collection of reasoned résumés of the important advances made in each subject written by a man who is a master of his particular subject. Nobody can afford to buy a new textbook on each branch of medicine each year, but most of us can afford to buy the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Medical Annual; using this in conjunction with a text-book, one can be certain of being up-to-date.

There is little new to be said about this year's *Medical Annual.* It is quite up to the standard of its predecessors; amongst its special features are the large number of beautifully reproduced coloured plates.

Turning first of all to tropical diseases, we find that all the recent advances have been recorded. The most striking work of the year has been that on yellow fever. As the writer of this section points out, this advance has not been made without loss on our side; two of the world's leading research workers, Noguchi and Adrian Stokes, fell victims to the disease. Plasmochin has been in use for some years in malaria, though its use has been extended considerably during the year under review.

Amongst the surgical subjects the treatment of gastric, pyloric and duodenal ulcer receives a considerable amount of attention. The question of the relative values of gastro-enterostomy and of excision of the ulcers in duodenal ulceration are considered. The medical man is reminded that he himself is subject to human ills by a paper in which the results of 100 operations on doctors for duodenal ulcer are analysed. They were nearly all treated by gastro-enterostomy and readers will be relieved to hear that in 90 per cent. the operation and the result were completely successful. In this section a number of new instruments are illustrated and there are also detailed illustrations of methods of excising gastric and pyloric ulcers in different positions.

Under the heading of anæsthetics there is a good summary of the work that has recently been done on Avertin, a new rectal anæsthetic. So far it has not been used to any great extent for producing complete anæsthesia, because for this the dose necessary approximates too closely to the toxic dose, but it has been used extensively as a sub-anæsthetic. Under its influence the patient goes to sleep quietly and minor operations can be performed, but for abdominal work an inhalation anæsthetic in small doses is used in addition.

L. E. N.

MANSON'S TROPICAL DISEASES: A MANUAL OF THE DISEASES OF WARM CLIMATES.—Edited by Philip H. Manson-Bahr. Ninth Edition. Revised. Cassell and Company, Ltd., London: Pp. XX plus 921, with 23 colour plates, 12 half tone plates, 401 figures in the text, 6 maps and 34 charts. Price, 31s. 6d. net.

THIRTY-ONE years ago the late Sir Patrick (then Dr.) Manson first published his *Manual of Tropical Diseases.* Since this date there have been eight new editions and a larger number of reprintings of this world-famous book. Throughout its thirty years of life it has been the standard handbook on tropical diseases for the English-speaking races. Larger books—running into a number of volumes—have been published in English and other languages, but in none of them have their producers contrived to be so comprehensive in so small a space. The earliest editions of this book had a smaller page sheet, wider margins and about half the number of pages of the present edition, and yet they contained an adequate résumé of contemporary human knowledge regarding diseases peculiar to the tropics. So great has been the advance in this branch of medicine that the present author—who modestly calls himself the editor—must have had considerable difficulty in condensing our present knowledge on the subject into the many times greater space of the present edition. We notice that the successive editions have assumed a 4-year periodicity. It seems to us remarkable that any one man can manage to keep so large a number of sections on so many diverse subjects so completely up-to-date; Dr. Manson-Bahr must have already begun the work of revision for his next edition.

It is absurdly easy for a reviewer to pick out what he considers mistakes in a book of this nature, but a review is scarcely complete without some criticism.

In the leprosy section the author makes no attempt to describe the course of the disease as it is now known. He states that the bacillus is found in the mucous membrane of the nose in the majority of early cases of leprosy, a misstatement long ago proved as such. He denies the presence of giant cells and seems to be unaware that in certain common types of lesion they are invariably found in large numbers both in the corium and in the thickened nerves nearby. In the leishmaniasis section, there are a few statements of minor importance with which the reviewer cannot agree; for example, there is no evidence in India that "kala-azar—unlike malaria—shows a predilection for the acclimatized—the natives," nor is the remark that "Sinton first suggested in 1922 that a sandfly was the insect vector" true in any respect. Mackie in 1914 concluded a report in his extremely valuable work in Assam by saying that he considered that the sandfly, more than any other insect, would repay further investigation, whereas we have been unable to trace the Sinton (1922) reference. Figure 38 is not a good example of a case of kala-azar; it is a caricature. The reviewer has not seen, during the whole of his experience in Bengal and Assam, more than a dozen patients in this extreme condition and certainly less than a quarter of these were really cases of kala-azar, though they were usually sent to him as such. The reproduction of photographs of such exaggerated examples is common in textbooks, but is nevertheless to be deplored, more especially when they are the only clinical type illustrated as they must inevitably give an entirely wrong impression to those unfamiliar with the disease.

We have searched in vain for a reference to justify the statement, attributed to Fairley, that "about 28 per cent. of malaria bloods in the acute stage of the disease ....give a positive Wassermann reaction." We are sorry to see this ghost, which we thought was laid some years ago, again revived. (From the reviewer's point of view one of the most irritating features of the book is the complete absence of references.)

Although in every case the author has given a good résumé of the published works on the various diseases, there are occasions when he displays evidence of lack of first-hand experience of the disease about which he is writing. Manson's *Tropical Diseases* is a book which will always find a first place in the medical library of the student of tropical medicine, both in England and abroad; nevertheless, the information contained in it is often insufficient for the "specialist"—and every medical man working in the tropics should be a "specialist" in the few main diseases of the region where he is working—and for the research worker. At the same time we would not suggest that this book be enlarged; on the contrary, we think the author should in future only put in new matter at the expense of the old so as to keep the book down to a reasonable-sized single volume. It is time that the vast subject of tropical medicine was split up and there is an opening for books on *regional tropical diseases* with the various chapters written by experts with recent practical knowledge on their particular subjects. The man going to India, for example, could in addition to his Manson, purchase the book on tropical diseases of India; from such a book trypansomiasis, schistosomiasis, etc., could be excluded and the extra space used up by dealing in greater detail with the diseases that do occur in India. At present, however, as far as India is concerned, such a book does not exist, and the practitioner here, or in any part of the tropics, cannot possibly afford to be without the latest edition of Manson's *Tropical Diseases.* The present edition has in every way maintained the high standard set by its predecessors and in some features it has surpassed them. The coloured plates, which include a few new ones, are excellent, the printing and paper are good, and the binding is pleasing and appears to be strong.

L. E. N.

THE DISEASES OF CHINA (INCLUDING FORMOSA AND KOREA).—By Dr. James L. Maxwell, M.D., B.S., Secretary, China Medical Association; Editor, China Medical Journal. Second edition. Shanghai, China Medical Association, 1929. Pp. 530, with 174 illustrations. P. O. Box 1121. Price, in China and the East, Mex. $10.00; in Great Britain £1.

WE have nothing but praise for this very well got-up and most informative book, which is the second edition

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

Vide **Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.**

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"The Selective Action of Antiseptics"

The proprietors of a certain antiseptic have for some time past been making misleading statements in their advertisements in the medical journals and in circular letters addressed to medical men as to the value of the Rideal-Walker Test.

They state that—"The test organism employed in this method is B. typhosus, and an antiseptic which will kill this organism in high dilution will not necessarily kill others under similar conditions."

It is desirable that the Medical Profession should not be misled on this important matter, and subjoined is a schedule showing the various organisms employed with this test by distinguished investigators as far back as the year 1909, when working with a certain well-known disinfectant which is still very largely employed by the Profession generally.

Investigator	*Organism*	*Rideal-Walker Co-efficient*
Prof. Sir William Simpson	B. pestis	34.0
Dr. David Somerville	V. cholerae	32.3
Prof. Sir William Smith	B. diphtheriae	20.0
Col. Sir R. H. Firth, K.B.E., A.M.S.	B. typhosus	11.0
Dr. Samuel Rideal	B. dysenteriae	10.0
Prof. Klein, F.R.S.	Staph. p. aureus	9.3

Copies of the approved technique of the Rideal-Walker test may be obtained on application to :—

THE AINSLIE WALKER LABORATORIES
40, LUDGATE HILL, LONDON, E.C.4.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of Jefferys and Maxwell's first edition. As far as we know, information about the diseases prevalent in China is very scanty and very difficult to get at; for instance almost the only paper dealing with the distribution of malaria in China is one by Faust in 1926, though Boeckh in 1923 mentions the introduction of epidemic malignant tertian malaria into Hoyun province by Sun Yat Sen's troops in that year. As editor of the *China Medical Gazette*, however, the author has had access to full sources of material and the result is a second edition which should be in the hands of every medical worker in China, and which will be of considerable interest to every medical practitioner in Asia. The illustrations alone will be of profound interest to medical men in the East, for there is hardly a phase of tropical medical practice which is not illustrated in the book.

The book opens with a most interesting account of medicine, past and present, in China. The indigenous systems of medicine in China do not have the vogue that the corresponding ones in India have; for we read that two well-known Chinese proverbs are that 'medicine is one of the nine low trades,' and that 'the ordinary physician kills men.' Ethical standards are completely lacking.

The main subject matter of the book is divided into two parts, dealing respectively with medical and surgical diseases. The book is remarkable throughout for its vivid descriptions of local conditions in China, of the difficulties with which medical men practising in that country are faced. We are also pleased to note that free resort has been made to such Indian journals as our own and the *Indian Journal of Medical Research* (and full acknowledgments made). Enteric fever is probably widespread in China and common in childhood, if Minett's observations in Hongkong are evidence. Typhus is common all over north China and extends as far south as Shanghai. In this connection the use of the common Chinese bread-steamer for delousing is most interesting. Leprosy is very fully dealt with; it is very common in China, but generally of mild type. The full technique of the method of treatment by infiltration of the lesions is given, and both Calcutta and Philippine Islands' reports have been drawn upon for information. Deficiency diseases are also fully dealt with, accompanied by a very striking colour plate of the rash in pellagra and photographs of cases of osteomalacia. The information on kala-azar is meagre, but on the whole fairly accurate; the author, however, terms the parasite of the disease the Leishman-Donovan body, whereas the correct name is *Leishmania donovani;* also we believe the aldehyde test to be far more reliable than the globulin test for the serum in this disease, though the latter only is described in the volume.

The section on metazoal diseases is illustrated by some very striking photographs of cases of filarial elephantiasis, and the distribution of the disease in China is discussed. The author, however, quotes the old view of Manson that lymphatic obstruction in filariasis is due to liberation of unhatched ova from the adult female worm; it is far more likely that the obstruction is due to migration of the adult worm itself towards the surface lymphatics. Ascaris infection appears to be almost universal in China, whilst Ancylostoma infection appears to be commoner than infection with Necator. *Fasciolopsis buski* infection is very common over large tracts of China, while infection with *Clonorchis sinensis* is reported from Kwantung and Kiangsi provinces. Contrary to what is usually supposed to be the case, tapeworm infections are relatively uncommon in China, though the aboriginal tribes in Yunan consume raw beef and suffer from *Tænia saginata* infection in consequence. Formerly an advocate of open operation in liver abscess cases, the author now relies almost entirely on emetine and aspiration. He is of opinion that bronchospirochætosis is a clinical entity, different from pulmonary tuberculosis, and that it is quite common in China.

Insanity appears to be a terrible problem in China, for the family system is well established in the country, and in the absence of mental hospitals the patient remains with the family who control him by any means, however cruel. The Kerr Hospital at Canton is the one solitary institution that is attempting to grapple with this terrible problem. Atriplicism is a curious Chinese disease due to eating the weed *Atriplex serrata* in times of famine; it is associated with acute œdema of the face and hands and cyanosis. Suicide is very common in China, opium and phosphorus being the poisons most commonly employed. A few years ago the opium habit was sternly checked in China, but recent years have seen a terrible recrudescence of the habit, troops even being paid in opium in place of money. Here there is a whole series of extracts from reports by different observers, which shed much light on the opium question in China. The morphia habit is also well established in the country.

The undifferentiated fevers of China are the subject of a short, but interesting chapter. Diseases peculiar to China are again a most interesting subject: China is the world's largest storehouse of freaks, and voluntary deformities are common. The artificial making of wild men is a terrible operation, described in the volume; it consists in removing the entire skin at repeated operations and grafting the skin of a dog or other wild beast in its place, the victim's larynx being also mutilated. Footbinding is now happily uncommon in China, but the condition is illustrated by a photograph and a skiagram.

Turning to surgical diseases, the book is remarkable for its wealth of illustrations of tumours and allied conditions. China in fact appears to be even more remarkable than India in its immense numbers of surgical cases of tumours which have been allowed to grow to a very late stage before surgical help is sought. Hernia is extremely common in China; untreated fractures abound, and often give rise to most curious deformities. Osteitis of all kinds is very common, and an interesting account is given of a case of complete removal of the sternum.

Eye diseases are an immense problem in China, and one of which only the fringe has been touched so far. The author is (rightly) emphatic that the general practitioner should not attempt advanced eye work, such as cataract operations; these should be left to the specially trained worker. The incidence of trachoma is variously estimated at from 10 to 50 per cent. in different parts of the country. Skin diseases have a very large place in the practice of medicine in China (and in this connection we are glad to see incorporated much of Acton and McGuire's work taken from this journal, and freely acknowledged). Molluscum fibrosum is the subject of several striking photographs. The chapter on tumours is unique; perhaps in no other country in the world could so extraordinary a collection of photographs have been got together. A full discussion is given as to the incidence any types of cancer seen in China. Vesical calculus is said to be especially prevalent in the province of Kwangtung, whilst a very striking photograph on p. 500 is one of a trayful of calculi removed from a urethral diverticulum. The general prevalence of syphilis is about 15 per cent., and probably twice that figure for troops; the disease was apparently well known in China as early as the 12th century A.D.; tabes dorsalis is rare in China, but it is stated that with the enormously increased nervous tension in the population of recent years owing to the chronic civil wars, it is markedly on the increase. Gonorrhœa in China is described in an ancient book by Huang Ti, B.C. 2736.

Finally, a word must be said as to the printing and binding of the book. For a work published in China, these are excellent. In general the very numerous illustrations are well executed.

Dr. Maxwell is to be heartily congratulated on this excellent treatise. It reads like the record of an expedition into unexplored territory, and it will be of interest to medical men throughout the East generally.

R. K.

THE STORY OF MODERN PREVENTIVE MEDICINE. —By Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. London: Bailliere, Tindall and Cox, 1929. Pp. XII plus 295, with 9 figures in the text. Price, 18s. net.

THIS volume is a continuation of the author's *Evolution of Preventive Medicine*, published in 1927, and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is intended at least as much for the layman as for the professional. It gives a simple and readable account of the discoveries in parasitology and physiology of the 19th century, after which the chief epidemic diseases of the world are considered separately, with accounts of the progress made in the struggle against them. Chapters VI, XVII and XVIII, deal with filariasis and Texas fever, malaria, and yellow fever respectively, and in these there are several statements not in accordance with modern beliefs. For instance, the exploded hypothesis that filariasis can be contracted by ingesting, or bathing in, water in which infected mosquitoes have died, is referred to on p. 137. On p. 138 the malaria parasite is called *Pyrosoma bigeminum*, whilst on p. 141 the parasite investigated by Theobald Smith is referred to as a *Plasmodium*. (*Pyrosoma* is a genus of deep sea Ascidians.) No mention is made of the work of Christophers in elucidating the cycle of *Babesia bigemina* in the tick. On p. 152 the sexual form of the malaria parasite is said to be a "sporozoite," whilst the statement on the same page that "mosquitoes prefer cattle to human beings" is not so generally applicable as the author supposes. There is a good deal of carelessness in proof reading evident in this section. Beauperthuy's name is misspelt on p. 145, at the bottom of which "mesozoites" is printed where "merozoites" is meant. On the next page "gamocytes" catches the eye. On p. 163 Laidlaw's name is also mutilated.

The second section of the book deals with physical and social conditions of health and calls for no special comment. The illustration in Fig. 9 of the medical student contracting a sore throat in his "diggings" in the early "eighties" will amuse as well as interest a later generation. The bottle on the table may or may not be beer.

The third section on "Some Physiological Conditions of Health" gives a simple and interesting account of the endocrine system, and the vitamins, with the diseases connected with their dysfunctions. The statement is made on p. 259 that rickets does not occur south of the latitude of Italy. We know that the disease occurs in Colombo.

The book closes with a final chapter on the evil of alcohol, which must especially appeal to the land of the author's adoption.

R. S. W.

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. TRANSACTIONS OF THE SEVENTH CONGRESS, HELD IN BRITISH INDIA, DECEMBER 1927. VOL. I.—Edited by Lieut.-Col. J. Cunningham, C.I.E., B.A., M.D., I.M.S. Pp. 865; fully illustrated. Calcutta. 1929, Messrs. Thacker's Press & Directories, Ltd. Price, Rs. 25.

WE have previously dealt so fully with this most important Congress (in our issues for March and April 1928) that here we need only point out that the first volume of the *Transactions* is now published, and that a few copies are available for sale from the publishers, in addition to the copies which are supplied to all full members of the Congress.

The *Transactions* of the Congress held in Hongkong in 1912 were published in a single volume of 399 pages; those of the Congress held in Japan in 1925 necessitated two volumes, totalling 2313 pages. The *Transactions* of the 1927 Congress at Calcutta, however, run to three volumes, of which this is the first, totalling in itself 865 pages. This alone gives some indication of how enormously the work and scope of the Association has grown. In addition to these three volumes a separate supplement will deal with the business proceedings of the Congress. The first volume has also a foreword by Major-General Sir T. H. Symons, Director-General, Indian Medical Service.

The present volume covers Sections I and II of the six sections into which the Congress was divided. It includes papers dealing with medicine and dermatology; pathology; surgery; ophthalmology; gynæcology and diseases of pregnancy; mental hygiene; radiology; dentistry; State medicine; general and special hygiene; maternity and child welfare. There is here a wealth of material for the interested reader to browse in. Noteworthy papers in this volume are the paper on secondary infections in enteric fevers by Lieut.-Col. F. A. F. Barnardo, I.M.S.: the two by Major H. Stott, I.M.S., on diabetes in the East; Sir Frank Connor's paper on the surgical aspects of filariasis, with Lieut.-Col. K. K. Chatterji's companion paper on the same subject. In the domain of ophthalmology Lieut.-Col. W. V. Coppinger, I.M.S., deals with glaucoma as seen in Calcutta, Major E. O'G. Kirwan, I.M.S., with the ocular complications of leprosy, and Major F. F. Strother Smith, I.M.S., with trachoma as studied in India. In the gynæcological and obstetric section Dr. Margaret Balfour's paper on diseases of pregnancy and labour in India is of first class importance; Dr. Agnes Scott's study of osteomalacia in India is equally interesting; whilst Dr. Kedar Nath Das' paper on operative midwifery in the pre-Chamberlen period is most fascinating and full of recondite information. Capt. Dunjibhoy's paper on the rôle of Indian hemp in the causation of insanity in India will appeal to mental specialists in this country. Dr. Galstaun's paper on radiological appearances in amœbic hepatitis and Madura foot opens up what is largely unexplored territory. Dr. Borland McVail's account of quarantine condition in the port of Calcutta is a paper of importance to all port officers of health. Lieut.-Col. A. D. Stewart's paper on the activated sludge process is a most important contribution to public health study in the tropics, whilst Lieut.-Col. A. J. H. Russell, I.M.S., discusses the question of population and public health in India—again a paper of first class importance. Dr. Ruth Young discusses the organisation of child welfare in India and the obstacles in its way; whilst a considerable discussion also took place on the same subject in this Section.

Altogether a most notable volume, and a noteworthy addition to the ever growing literature on tropical medicine and surgery. It only remains to add that the style of printing, binding and publication, are admirable; and to congratulate Colonel Cunningham, as Organising Secretary to the Congress, on the publication of the first of the three volumes of the *Transactions*.

R. K.

NEUROLOGICAL EXAMINATION.—By Charles A. McKendree, A.B., M.D. Philadelphia and London: W. B. Saunders Company. 1928. Pp. 280. Illustrated. Price, 15s. net.

"THE purpose of this book" to quote the author's own words "is to familiarise the medical student and those interested in post-graduate specialisation with a comprehensive and systematic form of examination of the central nervous system. The abnormal reactions are interpreted as pertinent pathological expressions of interference with anatomical relations and physiological functions in such a way as to give to the student clinical pictures of pathology which he may readily understand and group under various syndromes."

The book is divided into convenient chapters covering such themes as the history, physical examination, general sensory examination, cerebral nerves, systemic examination, skeletal system, mental status, etc. Under each head, lucid and exhaustive treatment of the various connected aspects are attractively brought out with suitable illustrations. In addition to the general subject matter of the book being presented in a uniformly praiseworthy manner of due proportion and proper perspective, the chapter on "mental status" deserves special mention as comprising excellently arranged collected matter on a subject which is at present engaging the attention of the student of psychology, sociology and allied branches of study. It is now widely recognised from extensive researches that "criminal tendency" is a pathological condition of the mind, just much like any other physical disease symptom. This attitude of outlook has of course not appealed strongly to dispensers of "law and order" yet; but it is bound to find universal acceptance in the near future.

We hope that in the next edition mistakes of a grammatical nature frequently committed in the text will be corrected. Dr. H. A. Riley introduces the volume with a brilliant foreword. The get-up of the book is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

'Schering Urotropin' tablets

the peerless disinfectant of the urinary and biliary passages

When you are making out your Urotropin prescriptions, do not fail to quote the name "Schering", as, in spite of the fact that 'Urotropin' is a registered mark, it is wise to protect oneself against the possibility of receiving imitations of the original 'Urotropin' which may be of doubtful chemical purity and of varying therapeutic effect. Thirty years of experience in the manufacture of Urotropin are the guarantee for the superiority of the original "Schering" product.

Tubes containing 20 tablets of 7½ grains.

SCHERING-KAHLBAUM (INDIA), LTD.

Telephone: Cal. 4770
Telegrams. Aeskulap

CALCUTTA

4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

20224801

F. SCHWERZMANN & CO., Rangoon (Burmah): 26, Merchant Street.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ALLONAL Trade Mark "ROCHE" Trade Mark

The modern remedy for insomnia and pain. Quick in action. Suitable for young and old. Not subject to D. D. A.

DIGALEN Trade Mark "ROCHE" Trade Mark

A really dependable Digitalis preparation, constant in composition, well tolerated. Given orally, intramuscularly, intravenously.

SIROLIN Trade Mark "ROCHE" Trade Mark

An improved Thiocol syrup containing but one drug: Thiocol "Roche" the well-known, safe remedy for affections of the respiratory system.

The above products are available in the following Packings:

Allonal 'Roche': Tablets in bottles of 12 and 100

Digalen 'Roche': Solution in bottles of 15 c.c.
Tablets (oral) in phials of 25
Ampoules in boxes of 6 and 12

Sirolin 'Roche': In 6 ounce "Roche" bottles only.

F. Hoffmann-La Roche & Co., Ltd.,

Basle, Switzerland.

Agents for India and Ceylon:

VOLKART BROTHERS

P. O. Box 606, Calcutta **Colombo** **P. O. Box 199, Bombay**

P. O. Box 22, Karachi **P. O. Box 45, Madras**

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

excellent. We have great pleasure in welcoming this little treatise.

S. S. R.

TUBERCULOSIS AND HOW TO COMBAT IT: A BOOK FOR THE PATIENT.—By F. M. Pottenger, A.M., M.D., L.L.D., F.A.C.P. Second Edition. St. Louis: The C. V. Mosby Company. 1928. Pp. 275. Price, $2.00.

THE author is a well-known writer on the subject of tuberculosis, and his classical textbook on this disease has a wide reputation not only in the United States but throughout the world. The present book, coming from such an authority, will carry much weight.

There is general agreement nowadays as to the principles along which tuberculosis should be combated, both in the individual and in the community, and many books have been written on this subject. It is only by the continuous education of the patient and his relations, and of the public at large that we can hope in the end to stamp out this disease. Dr. Pottenger's style is lucid and he puts forward many practical hints which will prove helpful to those who seek to fight against tuberculosis.

E. M.

FRACTURES AND DISLOCATIONS: IMMEDIATE MANAGEMENT AFTER CURE, AND CONVALESCENT TREATMENT WITH SPECIAL REFERENCE TO THE CONSERVATION AND RESTORATION OF FUNCTION.—By P. D. Wilson, A.B., M.D., F.A.C.S., and W. A. Cochrane, M.B., Ch.B., F.R.C.S. (Edin.). Second Edition, revised; London: J. B. Lippincott Company. 1928. Pp. XVII plus 789 with 1029 illustrations. Price 45s. net. Obtainable from Messrs. Butterworth and Co. (India), Ltd. Price, Rs. 33-12.

IT is a pleasure to review a second and revised edition of this excellent book; that a second edition would follow was a foregone conclusion.

A detailed account of the work is quite unnecessary, as this has already appeared in the *Indian Medical Gazette* for April, 1926. The book remains the same, except that "new methods and illustrations have been incorporated." Every surgeon and general practitioner must make himself familiar with the latest teaching on fractures and dislocations, and they could not do better than to select this book for the purpose. There are 19 chapters and 1029 illustrations; the latter are admirably executed, and liberally elucidate the text.

The publishers are to be congratulated on the way in which their work has been carried out in all respects; the English reader will not be irritated by American phraseology and spelling.

F. P. C.

PRACTICAL CLINICAL LABORATORY DIAGNOSIS.—By C. C. Bass, M.D. and F. M. Johns, M.D. Third Edition, 1929. Pp. 187 with 20 plates, 134 illustrations, including colour plates and photographs. London: Bailliere, Tindall and Cox. Price, 34s.

THIS is an excellent manual, which should be in the hands of every laboratory worker. It is remarkable especially for its exceedingly complete series of photographs and for its colour plates. It is divided into 17 chapters, with 2 appendices, and is a wonderfully complete presentation of the subject in small compass. The use and care of the microscope, the preparation and staining of blood films, differential leucocyte counts, platelet counts and hæmoglobin estimations, blood-sugar and other special blood tests, malaria, the Widal reaction, examination of the urine, gastric contents, and fæces, of pus and exudates and sputum; leprosy, the spinal fluid, tests in diphtheria, gonorrhœa and syphilis are all detailed very fully. The appendices deal with formulæ and apparatus. The book is exceedingly well printed and illustrated on glazed paper, and well bound. It may seem expensive, but we do not consider it so when the tremendous number of illustrations—134 plus 20 plates—many of which are in colour, in 187 pages—is considered.

The chief merit of the book, indeed, is its profuse illustrations, many of them photographs of successive steps in a laboratory procedure. Thus in the matter of blood counts we have successive illustrations of the diluting pipette, the counting chamber from vertical and lateral aspects, taking the blood into the pipette from the patient's finger, diluting it in the pipette, revolving the pipette so as to thoroughly mix its contents, cleaning the cover glass, squeezing out the diluted blood into the counting chamber, each of the five steps in cleaning and placing the special cover glass over the counting chamber, looking at the distribution of cells to see that they are uniform, and of even and uneven distribution of cells—in all no less than twenty illustrations—many of them photographs—of the procedures employed in this one procedure. This alone will give some idea of how thorough the book is, and of how valuable it will be to laboratory workers in general.

In connection with each laboratory procedure the authors have given one method, and one method only, having selected in each case what they believe to be the best. The appendices are also very helpful, for they indicate with how small an amount of equipment the laboratory worker can carry out all tests ordinarily required. The colour plates also are a special feature of the volume, and (with one exception) admirably executed.

Of specially tropical diseases only malaria and leprosy receive consideration. With regard to the former, although colour plate VI of the malaria parasites is supplemented by a series of very fair photomicrographs, yet in our opinion it is very disappointing. We doubt indeed whether a student could learn to differentiate species from it. The delicate hair-like rings of *P. falciparum* are here shown as almost massive, whilst the hæmozoin pigment in *P. malariæ* is here almost wanting. Partly this may be the publishers' fault, but the plate is very disappointing. A less crowded plate with fewer but more accurate figures would have been better. In connection with leprosy no mention of examination of the nasal secretion is made, and the coloured illustration of the lepra bacilli is poor; we doubt whether a medical practitioner proceeding to the tropics could reliably diagnose leprosy from this account.

With these exceptions the book is admirable. Its account of the dark ground examination for *Treponema pallidum* is good, though the account of the morphology of the spirochæte might be extended. No less than six photographic illustrations show how to draw blood for the Wassermann or other specific reaction from the antecubital fossa. The Butler precipitin test, however, and not the classical Wassermann test or any of its modifications, is described.

On the whole, a book which has many excellent points and will be most helpful to the laboratory worker, but which, we think, might be improved with regard to tropical diseases.

R. K.

HANDBOOK OF BACTERIOLOGY.—By J. W. Bigger, M.D., Sc.D. (Dublin), F.R.C.P.I., D.P.H., M.R.I.A. Second Edition. London: Bailliere, Tindall and Cox. 1929. Pp. XVI plus 452, with 2 plates and 82 text figures. Price, 12s. 6d. net.

THIS little book should prove extremely valuable as a class book for M.B. students in this country. It gives the student an excellent introduction to the subject of bacteriology. The author has balanced theory and practice nicely and thus produced a book which will give the medical practitioner an insight into the theories of bacteriology and immunity and at the same time sufficient instructions to carry out minor bacteriological examinations for himself. It does not claim to be a book for the laboratory worker. It is, of course, disappointing to find that the protozoa have only been allowed 19 pages and the pathogenic fungi 7, but this is always their fate in textbooks, whether in Europe or America, and the average examinee is not expected to know more of the subjects than will be found in these pages.

The book, which is well bound, and well printed on good art paper, is strongly recommended to both students and teachers.

L. E. N.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LIPPINCOTT'S POCKET FORMULARY.—By G. E. Rehberger, M.D. Second Edition, revised. London: J. B. Lippincott Company Ltd. 1928. Pp. 201. Price, Rs. 11-4. Obtainable from Messrs. Butterworth and Co. (India) Ltd.

A most immoral but an exceedingly useful little book. A patient comes to you with asthma; all you have to do is to turn up "asthma" and you will find 31 different prescriptions. Before you have reached the 31st prescription you may be sure you will have cured your patient—or, at any rate, he will have left you—so it will be as well to start with the last prescription now and then, and work backwards. With tropical diseases, however, the reader will be less fortunate; for sprue there is only one prescription—emetine hydrochloride, but there are a number of suggestions for diet, in fact almost everything but liver is suggested. It is a pity that there was no cross reference here, because under "anæmia, pernicious" there is a really valuable collection of recipes for cooking liver.

For kala-azar potassium antimony tartrate alone is given, together with a ten-year-old reference from Knowles regarding the length of the course of treatment necessary.

The second half of the book is devoted to tables of official (United States) and non-official remedies. These tables should prove exceedingly valuable in America, but rather less so in India. It has been made into a handy-sized volume quite suitable for the pocket. The paper is thin but opaque, and the print clear.

L. E. N.

PROCEEDINGS OF THE IMPERIAL SOCIAL HYGIENE CONGRESS AT THE CAXTON HALL, LONDON, S. W. I. OCTOBER 3RD TO 7TH, 1927. —Organised by the British Social Hygiene Council. Published by the British Social Hygiene Council, Inc. London. Pp. 313.

This publication affords much valuable reading, the Indian section being of particular interest. Colonel Harrison's paper on the modern treatment of syphilis lays stress on the individual variations in response to treatment, an unexplained phenomenon familiar to most of us and one that offers a field for further investigation. Major Lloyd's paper on the Wassermann reaction is of great interest. He is quite definite in his opinion on the influence of malaria and kala-azar on the reaction and points out the frequency of mixed infections. Dealing with the question of blood transfusion the risk of communication is alluded to. Major MacIver points out the similarity of yaws and syphilis and the difficulties arising therefrom. The less technical part of the publication contains much of interest to this country and deals with education in a paper by Richey, while the teaching of biology in the vernacular schools is touched on by Hanns Vischer. The problems of the colonies occupy a considerable portion of the volume and afford interesting reading in the light of our own difficulties. The *Proceedings* are full of interest and should offer help and guidance to all whose work is concerned with venereal disease and social hygiene.

A. D. W.

TECHNIQUE AND METHOD OF USE OF STERNBERG'S GASTROSCOPY AND GASTROSCOPIC TREATMENT.—By William Sternberg, Berlin. Pamphlet of 19 pp. with 7 illustrations. 1929. London, John Bale, Sons & Danielsson. Price, 3s. 6d.

This is a full and fully illustrated account of the author's method of gastroscopy with his cysto-gastroscopic apparatus. Every step in the procedure is detailed, from the preliminary examination of the apparatus to see that everything is in order, and the necessary preliminary examination of the patient to exclude contra-indications, to an account of the lesions seen in the pylorus and a most instructive plate showing the appearances presented by pyloric ulcers as seen through the gastroscope.

The author emphasises that this little book is *not* intended for the specialist but for the general surgeon and medical practitioner. As the result of his researches, the necessity for holding regular courses of practical instruction in his gastroscopic method has arisen, and the book is intended to serve as a practical guide for such classes. Gastroscopy may be a novelty to-day, but it probably has a future ahead of it. Surgeons and those who have to treat cases of gastric and pyloric ulcer will be interested in this useful thesis.

ANNUAL MEDICAL LIST, 1929.—Published by the Bengal Council of Medical Registration, Calcutta.

This publication follows upon the usual lines. Its price is not stated, but it is presumably to be had from the Bengal Council of Medical Registration, Grosvenor House, 21, Old Court House Street, Calcutta.

The *List* gives first the text of all Bengal Medical Acts and emendments from 1914 to the present day; then a list of all medical practitioners registered in Bengal, classified alphabetically by surnames. The total number of these is now 5,897, whereas it was only 1,230 in 1915—the first year of registration. Information with regard to professional conduct and medical ethics is then given as an appendix.

The *List* will be found essential in official and non-official medical schools, colleges, and other institutions in Bengal. (Presumably other provincial Medical Councils in India publish similar lists, but so far we have not received any.)

ENDOCRINE DIAGNOSTIC CHARTS.—By Henry R. Harrower, M.D. Pp. 144. 1929. The Harrower Laboratory, Inc., Glendale, California.

This is a type of book with which the medical profession has now become familiar, a compound of scientific information and advertisement, very informative, very well got up, but perhaps rather prejudiced in its views. It frankly assumes that endocrine dysfunction lies at the root of many of the diseases to which mankind is heir, and that endocrine administration will cure that dysfunction; the author, in fact, tells us that as he travels in the electric railways of New York city he is wont to inspect his fellow passengers from the endocrine point of view. On the other hand, the medical student or practitioner who studies the chart on p. 73, on the relations of the endocrine glands to one another, or chapter IV, "an outline of endocrine disorders," may well be driven to despair. We are told that the library of the Harrower Laboratory contains nearly fourteen hundred books dealing with various phases of the internal secretions, and more than forty thousand reprints, clippings, and abstracts. The present volume represents an attempt to condense this tremendous wealth of information into a simple manual for the general practitioner. The blank spaces which were available when the matter was set up in paged proof have been utilised for accounts of the Harrower policy.

A book such as this is useful in one way. It does give the general practitioner a general review of what is known about endocrine secretions, and tables for the diagnosis of endocrine deficiencies. Its account of methods of standardisation is also valuable. But to the British reader its admixture of scientific information and advertising may seem undesirable.

The book, however, may well be found to be a very useful one to the general practitioner, if he will not allow himself to be carried away by the author's enthusiasm in his subject.

R. K.

ELEMENTS OF SURGICAL DIAGNOSIS.—By Sir Alfred Pearce Gould, K.C.V.O., C.B.E., M.S., F.R.C.S. Seventh Edition. Revised by E. P. Gould, M.D., M.Ch. (Oxon.), F.R.C.S. (Eng.) London: Cassel and Company, Ltd. 1928. Pp. XV plus 730 with 28 Radiographic Plates. Price, 12s. 6d. net.

Although first published forty years ago, this book has lost none of its value. The substitution of introduction in place of the first three chapters of the older edition is a useful change. It will make the approach to the rest of the book easier to students. Cholecystography and the use of lipiodol with *x*-rays are new

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PITUITARY EXTRACT B.D.H.

(Posterior Lobe)

From the time it was first issued for medical use Pituitary (Posterior Lobe) Extract B.D.H. has been standardised for two entirely different effects as follows :

Its action in the contraction of the uterine muscle

Its effects upon blood pressure

Pituitary (Posterior Lobe) Extract B.D.H. is entirely British made; it is manufactured in the B.D.H. laboratories from carefully collected and dissected glands, and every batch is guaranteed to be of uniform activity.

Descriptive literature will be sent on request to either of the B.D.H. resident representatives :—

HENRY S. CLARK,
8-10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Buildings,
Parsee Bazar Street,
Fort, BOMBAY.

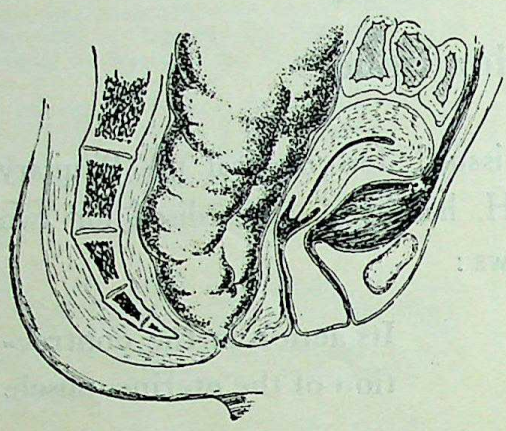
THE BRITISH DRUG HOUSES LIMITED
LONDON

Pit. Ext./In./298.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

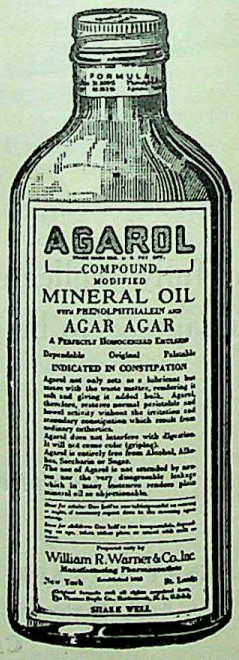
Digitized by Arya Samaj Foundation Chennai and eGangotri

The Menace of the Overloaded Bowel



always present, easily becomes serious in women. It causes interference with the pelvic circulation and tends to produce congestion of the uterus, not infrequently followed by functional disorders, producing dysmenorrhœa, menorrhagia, and even inflammatory conditions.

AGAROL gives relief and frequently permanently restores the functional activity of the colon. One tablespoonful before retiring, gradually decreased as improvement takes place, is especially well adapted for the treatment of constipation in women, because of the gentle action of Agarol and absence of irritation from its use.



Agarol is the *original* Mineral Oil—Agar-Agar Emulsion (with Phenolphthalein and has these advantages:

Perfect emulsification; stability; pleasant taste without artificial flavouring; free from sugar, alkalies and alcohol; no oil leakage; no griping or pain; no nausea; not habit forming.

WILLIAM R. WARNER & CO., INC.
Manufacturing Pharmaceutists Since 1856,
113-123 WEST 18th STREET,
NEW YORK CITY.

Agents in India:—
MARTIN & HARRIS,
Rowlette Building, Prinsep Street, Calcutta;
119, Parsi Bazar Street, Fort, Bombay;
and 20, Sunkurama Chetty Street, Madras.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

additions to the book. There are additions and alterations in almost every chapter. The book is a very useful one and can be strongly recommended to senior students.

S. N. M.

NEURO-SURGERY.—By W. Sharpe, M.D., and N. Sharpe, M.D. London: J. B. Lippincott Company. 1928. Pp. 762 with 208 text illustrations and 5 coloured plates. Available from Messrs. Butterworth and Co. (India) Ltd. Price, Rs. 31-8 net. (42s.)

THE book will certainly bring neuro-surgery to the front. It is well written and new ideas have been given in different chapters regarding treatment. The treatment of hydrocephalus as suggested is very interesting. The stress laid on performing the decompression operation in brain tumours, whether removable or not, is a move in the right direction. The co-operation of the surgeon and the neurologist has been rightly advocated.

The authors point out the usefulness of ophthalmoscopic examination of the eye in all cases of cerebral lesion.

A good deal of attention has been drawn to the utility of lumbar puncture. Intra-cranial hæmorrhage at birth has been very ably dealt with. It is interesting to know that in several children, spastic paralysis is due to intra-cranial hæmorrhage at birth.

Very truly it is stated by the authors that in intra-cranial pressure, often operations are performed when they should not be carried out.

This is an excellent book which can be strongly recommended to surgeons who wish to specialise in neuro-surgery.

S. N. M.

LA VACCINATION ANTITUBERCULEUSE AVEC LES BACILLES VIVANTS CHEZ LES ANIMAUX ET CHEZ L'HOMME.—By Prof. Alberto Ascoli. Istituto Editoriale Cisalpino, Milan.

THIS is a French abridged translation from the original Italian. We have heard so much for and against Calmette's B. C. G. that this book, which studies the whole subject thoroughly, is specially welcome. There are twelve chapters; in the first four of these the author shows the value of B. C. G. given subcutaneously as an immunising agent especially in young cattle, and compares it favourably with methods of immunisation employed by Griffith and others.

In the later chapters he deals with the oral method of administration of B. C. G. in new-born infants. He lays down three requirements as fundamentally essential for any method of immunisation against tuberculosis in human beings: (*a*) it must be devoid of danger; (*b*) it must provide considerable protection against the disease, which must be either lasting or else renewable by revaccinations; (*c*) it must be capable of being used effectively in widespread application.

It would appear that there is little danger attached to the oral administration of B. C. G. in the new-born. However, the effectiveness of this method of immunisation is not yet fully proved. The statistical methods used by Calmette in proving its efficiency are criticised, and full quotations are made from the criticisms of Dr. Greenwood, Professor of Endemiology and Statistics to the University of London, who demonstrates that the statistics quoted by Calmette and his interpretation of them are entirely erroneous and misleading and then goes on to show what methods should be adopted if correct results are to be arrived at.

In the last chapter the author deals with certain economic and social conditions regarding the immunisation of infants, and mentions 257 cases of new-born infants vaccinated with B. C. G. by the L'Institut Vaccinocene Antituberculeux. These infants were all exposed in their homes to serious tubercular infection from their parents and others; but only 21 out of the 257 cases had died up to date, and in none of these was there any sign of tuberculosis; the remainder still remain healthy.

An English edition of this book would be valuable and we trust the author will arrange for this without delay.

E. M.

Annual Reports.

REPORT ON THE HEALTH OF THE BRITISH ARMY FOR THE YEAR 1927. LONDON, 1929. H. M. STATIONERY OFFICE. PRICE 4*s.* 6*d.* NET. (OBTAINABLE IN INDIA FROM MESSRS. THACKER, SPINK & CO., CALCUTTA AND SIMLA; MESSRS. THACKER & CO., BOMBAY; AND MESSRS. HIGGINBOTHAMS, LTD., MADRAS AND BANGALORE.)

THIS annual report is always of profound interest to military medical officers. Indeed it is wonderful to consider how vast has been the improvement in the health of the far-flung British Army during the present century. There was an increase of 12.9 per 1,000 in the admission rate in 1927 and of 1.79 per 1,000 in the constantly sick rate, but both are due to a high incidence of disease during the early months of the occupation of Shanghai. In India there was a most remarkable reduction of 26.4 per 1,000 in the admission rate, chiefly due to a decline in malaria. From the same country there has also been a very marked reduction in the number of invalids sent Home for middle ear disease, following upon special investigations and action taken thereon.

Officers showed an admission rate of 317.8 per 1,000 strength; malaria, influenza, and tonsillitis being the three chief causes. Dysentery is curiously low in this return—only 58 cases. The death rate was only 3.38 per 1,000—a very low figure. Amongst troops in general the admission rate was 467.7 per 1,000 of strength, an increase on the figure for 1926 chiefly due to an outbreak of venereal disease among the troops in Shanghai shortly after their arrival there. The principal causes of admission to hospital are in order of frequency malaria, venereal diseases, tonsillitis, inflammation of areolar tissue, influenza, bronchitis, and —curiously enough—sandfly fever, which was responsible for 2.668 cases. The figure for dysentery is again low—1,035 admissions, and speaks well for the standard of sanitation maintained in many different countries. The death rate—2.42 per 1,000 strength—is also a tribute to the standard of efficiency maintained.

Interesting graphs follow which show the very marked reduction year by year in the incidence of tuberculosis, syphilis, and diseases of the nervous, digestive and circulatory systems from 1899 to 1927. Invaliding from all causes is higher than it was in 1913, but the effects of the war have not yet been entirely recovered from. A curious feature of the table dealing with this point is that otitis media figures highest in the returns for invaliding, with tuberculosis second, epilepsy third, and cardiac diseases fourth. One would never have expected this high incidence of otitis media; can it have any association with the British Tommy's love of bathing in a tank, river, or stream when one is available? Gonorrhœa is far and away the chief cause of inefficiency on account of stay in hospital. There then follows an interesting graph showing the most important diseases in the Home commands, which shows clearly that at Home the venereal disease problem has been grappled with; the figures are almost unimportant when compared with influenza and other diseases. On the other hand, the corresponding graph for diseases in other commands shows a very high incidence of venereal diseases; here they become very important.

Turning to the chief diseases concerned, diphtheria was prevalent in the Home Eastern Command, at Caterham, and an outbreak occurred at the Queen Victoria School, Dunblane. The incidence of dysentery was 5.5 per 1,000 and a great change is reported; whereas formerly it was believed that almost all the dysentery in the British Army was amœbic in origin, it is now

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

recognised that it is almost all of bacillary type. India has the highest incidence of any country concerned. The incidence of enteric fevers was only 1.3 per 1,000. Influenza, on the other hand, reigns almost supreme—incidence 24.1 per 1,000; and it is clear that this disease constitutes one of the most important problems for the military medical authorities. Malaria accounted for admissions of 289.6 per 1,000 in West Africa; 138.8 in India; 82.7 in Mauritius; and in the Army generally for 49.5 per 1,000. An increase in Egypt was largely due to relpases in troops sent from India to that country, but north China and Shanghai had bad reputations during the year. Pneumonia was responsible for 3.6 per admissions per 1,000, with a case mortality of 10.8. These figures are interesting as they give the death rate among a healthy and medically selected population. An anti-vaccine was on experimental trial at Woolwich. Sandfly fever varies widely in incidence from year to year; it was especially prevalent in 1927 in Egypt, Iraq and Malta. Pyrexia of uncertain origin shows very wide variations indeed from one country to another. The majority of such cases are annually reported from Egypt, and may be due to unrecognised sandfly fever or to mild intestinal infections. Jamaica appears to have a short seasonal fever of its own and Bermuda also, whilst dengue (often perhaps unrecognised) is prevalent in Malaya. Shanghai also has a peculiar "Shanghai Yangtse fever," the origin of which has not been traced so far. The same command also showed a high incidence of pulmonary tuberculosis. In Malaya the closing of brothels has led to the (usual) increase in the incidence of venereal disease. (This very important question has been a knotty problem for many years; is it better to have brothels which are officially inspected, with relatively less venereal disease; or none, with increased clandestine prostitution, no inspection, and increased venereal disease? Different countries have settled the matter in different ways with regard to their armies).

Most of the dengue in 1927 was reported from India and Aden. Malaya is also heavily infected. Mental disorders were unimportant—151 admission only, or a ratio of 0.5 per 1,000 strength. Eye diseases accounted for an admission rate of 4.9 per 1,000. Tonsillitis figures very high in the returns—admission rate 33.8 per 1,000; it is most prevalent in the Home commands. Amongst women the general admission rate was 180.1 per 1,000, and amongst children 172.0 per 1,000. In the latter class tonsillitis, bronchitis, diarrhœa and measles, figure high.

On pp. 34—55 there next follows a most interesting account of the work of the specialist departments. In the medical department special attention is being paid to the incidence of respiratory diseases in the Army, whilst the search for a really effective remedy for chronic intestinal amœbiasis still goes on. Four cases of kala-azar were treated at Millbank during the year. Vaccine treatment is especially on trial with regard to gonorrhœa, pneumonia and tuberculosis. Surgical work in the Army is now of a very high order, and many military hospitals are equipped with really first class operating theatres. Ether is the anæsthetic most generally employed. A new portable *x*-ray apparatus has been standardized for use in the Army both in peace and war, and this step will greatly simplify radiological examinations, for those using the apparatus will be fully familiar with the standard pattern. The special incidence of otitis media led to the issue of orders that this complaint was to be especially looked for among recruits; it is often first discovered when the new recruit turns out to be deaf on parade. In the matter of hygiene, constant improvements to barracks and water supplies are mentioned. New tables for physical training of recruits have been introduced throughout the Army generally. Mother and child welfare centres continue to be established, five new ones having been opened in the Aldershot command during the year. The Army Hygiene Advisory Committee dealt with such diverse problems as the chloramine treatment of water, the regulations for disinfection, diphtheria at the Guards' Depôt at Caterham, the health of the Shanghai Defence Force, and the effect of work in tanks on the soldiers of the Royal Tank Corps. The Pathology Department reports a year of continuous investigations of specialist problems, and a large number of new publications. Army dental centres are better equipped than before. The ratio of recruits discharged within the first six months of training shows a marked increase—chiefly due to more rigorous inspection for middle ear disease. It is interesting to note that, in order of frequency, the chief causes for rejection are middle ear disease, loss of teeth, defects of the lower extremities, flat feet, and defective vision. This gives some idea of how thorough the medical examination of the recruit has to be in times of peace if the Army is to maintain its fine physical standard. It is noted that appropriate dental treatment will often enable men who would otherwise have to be rejected to be engaged.

Section III of the report deals with the health of the Army in the various commands. Here what will interest our readers will be the section on India, pp. 83—95. The admission rates per 1,000 were for officers 24.65, other ranks 30.85, women 12.15, and children 11.91. The corresponding death rates were 3.63, 2.82, 4.39 and 14.27. Malaria, of course, heads the list as a cause of sickness—7,723 admissions in the year of soldiers, and 168 of officers. The average number of constantly sick in hospital was 30.85 per 1,000 of strength. Mosquitoes and sandflies are the chief enemies of the British Army in India in times of peace, and even much of the "inflammation of areolar tissue" which figures so prominently in the returns is due to insect bites. Peshawar returned a very high incidence rate of sickness, but at Lahore mosquito-proofing of barracks has led to a notable reduction in the incidence of malaria from 1,038 per 1,000 in 1924 to 255.3 in 1927. With regard to dysentery year by year sees a steady "change-over" in the reported prevalence of amœbic and bacillary types, and it is now realised that bacillary dysentery is far more common than amœbic. Peshawar, Delhi—recently pronounced by an authority to be the best example of a "malaria-free enclave within the Indian Empire"—and Quetta continue to report high malarial incidence. Approximately one-quarter of the sickness in the British Army in India is due to malaria; admissions for this disease amounted to 138.8 per 1,000 of strength. At Delhi the figure was 452.9 and at Peshawar 490.4. A satisfactory feature of the report is the steadily lessening incidence of venereal disease in the figures for India, though Madras, Bombay and Bangalore reported high incidence. Rangoon also figures as head of the list, with an incidence of 219.4 per 1,000 strength. The Central Dermatological Laboratory at Poona continued to do excellent work in the diagnosis of venereal disease during the year, as also to give special instruction in this subject to newly arrived junior R. A. M. C. and I. M. S. officers. In the Ceylon command dengue and gonorrhœa head the list of incidence of the different diseases, whilst the return for malaria (in this most notoriously malarious island) was completely negative. In Malaya the incidence per 1,000 for admissions was 81 for gonorrhœa, 78 for dengue, and 25 for malaria. In Mauritius malaria headed the list; in North China and Shanghai, gonorrhœa.

A very interesting account of sanitary conditions (or rather their absence) in Shanghai is given on pp. 121—132. The defence force finally reached a maximum strength of personnel of over 16,000 and accommodation had to be improvised from the beginning. The water supply from the Wangpo river was highly polluted, and this state of affairs was met by chlorination. Fly-proof bucket latrines were used, and ablution benches and hot and cold baths erected. Ice chests were plentiful and proved invaluable. Owing to the especially heavy incidence of helminthic infection among the Chinese, all Chinese employed as cooks were subjected to the most rigorous medical inspection before they were enlisted. The troops landed in the most bitterly cold weather, whilst the town was crammed to overflowing with refugees, and sanitary conditions were entirely lacking. Under such conditions an admission rate of 744.6 per 1,000 is not surprising—the British battalions from India showing more sickness

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A FOOD that RAISES the DEFENSIVE POWERS of the Body

Virol is composed of marrow fat, glycerine extract of red bone marrow, eggs, salts of lime, iron, etc., malt extract, and the juice of fresh lemons blended in balanced proportions into an exceedingly fine and palatable emulsion, and prepared in such a manner as to retain unaltered the vital constituents of each of its components.

Its Influence on Resistance

"A series of experiments was undertaken at the Monsall Fever Hospital, Manchester, to ascertain the effect of various nutritive substances in increasing the resistance of the patient to the micro-organisms of the commoner specific infections.

"In the case of Tuberculosis it was found that the opsonic index to the Bacillus Tuberculosis was raised considerably in patients to whom Virol had been administered, and Virol was subsequently in routine use at that Hospital for 450 beds, not only in Tuberculosis, but also for most of the more severe cases of Typhoid Fever, Scarlet Fever and Diphtheria, with entirely satisfactory results."

Medical Superintendent,
Monsall Fever Hospital, Manchester.

Its Restorative Power in Convalescence

Virol has, moreover, a marked effect upon the conservation of the tissues, repairing waste and restoring the equilibrium of a healthy metabolism. Its unequalled value as a repairer of tissue waste is of the utmost importance in bringing about a sound convalescence.

VIROL

VIROL LIMITED, HANGER LANE, EALING, ENGLAND

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

'Byno' Hypophosphites

Trade Mark

An efficient Digestive, Tonic and Restorative

Invaluable in retarded convalescence and asthenic conditions generally.

In 'Byno' Hypophosphites are combined the tonic qualities of the Nux Vomica and Cinchona alkaloids, the restorative value of the mineral hypophosphites, and the nutritive and digestive powers of 'Bynin' Liquid Malt, which is the basis of the preparation.

'Byno' Hypophosphites has for long been prescribed with great success in convalescence after acute infections and following surgical operations; in nervous and mental conditions due to overstrain or exhaustion; as an adjunct in the treatment of tuberculosis; in asthenia of the aged, and in a diversity of conditions where a general tonic and digestive is indicated.

COMPOSITION:

Calcium Hypophosphite	2 gr.	Iron	$\frac{1}{4}$ gr.	Nux Vomica Alkaloids	
Potassium	2 „	Manganese ...	$\frac{1}{4}$ „	(equal to Strychnine)	$\frac{1}{40}$ gr.
Sodium	2 „	Cinchona Alkaloids	$1\frac{1}{2}$ „	'Bynin' Liquid Malt ...	1 oz.

In bottles containing 10 oz., 20 oz. and 40 oz.

Further particulars will be sent on request.

Allen & Hanburys Ltd.
LONDON

Special Representative for India:
A. H. P. JENNINGS,
Block E, Clive Buildings,
Calcutta

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

than those from Home. Then came the hot weather, when climatic conditions were reversed, and khaki drill was issued. Malaria, enteric fevers, dysentery and pneumonia were the diseases chiefly responsible for sickness. A special feature of the expedition was that the medical units went out fitted with complete dental personnel and equipment. Three specialist dental officers were on duty with the force.

We have tried to give a succinct review of this most important publication. Its interest is unique. Rigidly selected for physique, but sent to almost every climate in the world and subjected to the attacks of a whole host of diseases, the British Army health returns constitute a symposium on world-conditions of health. There is perhaps no other report (with the exception of the Rockefeller Foundation reports) which deals with so vast an area. This volume should be in the hands of every military medical officer and of every public health official in India.

ANNUAL REPORT OF THE EUROPEAN HOSPITAL FOR MENTAL DISEASES AT RANCHI FOR THE YEAR 1927. BY LIEUT.-COL. O. A. R. BERKELEY-HILL, M.A., D.M., I.M.S., PATNA, 1929. SUPERINTENDENT, GOVERNMENT PRINTING, BIHAR & ORISSA.

THIS somewhat belated report has only recently come to hand, but is of considerable interest, as Col. Berkeley-Hill's reports always are.

There was accommodation for 206 patients during the year, whilst the fees for first and second class paying patients were raised to Rs. 300 and Rs. 200 respectively per month. Admission for the year totalled 70, and re-admissions 22. The latter figure is very high, and Col. Berkeley-Hill comments adversely on the entire absence of any "after-care" association for patients in northern India, with the exception of the Calcutta organisation. Voluntary boarders have steadily increased from 1920 to 1927 and numbered 23 in the year under review.

Eight mentally defective children were admitted during the year, and here Col. Berkeley-Hill touches upon one of the most important of Indian problems. The Local Governments who contribute to the upkeep of the Hospital, when consulted, replied that they considered that a comprehensive and not a makeshift plan was necessary. "The whole subject of mental deficiency in India needs a whole-time champion, and until such a one arises it is not likely that there will be much progress towards some solution of the problem" writes Col. Berkeley-Hill. "But even now the situation is not quite hopeless. During the year the Government of Bengal asked me to inspect the Children's Home at Kurseong and the Colonial Homes at Kalimpong, with a view to seeing to what extent they might be associated with a scheme for the care and treatment of mentally defective children in Bengal. The province of Madras, going still further, reached the stage of contemplating the construction of a special institute, for mentally defective children on up-to-date lines."

Criminal insanes under treatment during the year numbered 7. The total population of the hospital during the year was 262 as against 253 in the previous year. Bengal, the United Provinces, and the Punjab sent the largest number, those coming from Bihar and Orissa numbering only 12. Approximately 24 per cent. of cases are discharged cured per annum. The death rate for the year was 4.62—one death being from drowning, either accidentally or suicidally, it could not be determined which. Influenza, malaria, and digestive troubles are largely responsible for such sickness as occurs.

Occupational therapy is largely relied on by way of treatment, the patients being put to rug-making, tailoring, making woollen and paper flowers, weaving, cross-stitch work, painting, etc. There is a ready sale for the products made, and a special stall of them was exhibited at the 1927 Congress of the Far Eastern Association of Tropical Medicine in Calcutta. Proposals for building suitable accommodation for this work have been passed. Hydrotherapy also plays an important part in treatment. Drugs, writes Col. Berkeley-Hill, only play a minor part in the treatment of mental disease; mental treatment alone is effective. The band continued to be a source of delight to patients and staff during the year; it consists of 7 members of the staff and 8 full time trained bandsmen. Musical drill is conducted to band music, and cinema entertainments, games, boating on the lake, and picnics are indulged in.

Minor improvements were effected in buildings during the year, but the water supply still causes anxiety. In June a failure of the electric supply very nearly stopped the entire water supply, and only the re-conditioning of an old steam pumping plant saved the situation. A club house for the staff was established during the year, and the library contains over 1,000 books. The co-operative stores continued to function as the main source of supply to the hospital. Receipts during the year amounted to Rs. 5,02,447; expenditure to Rs. 4,46,052 (net); and the average cost per patient during the year to Rs. 2,287—a very considerable reduction on the figures for previous years. There was no matron during the year, and one is certainly necessary. Colonel Berkeley-Hill pays a special tribute to the work of his staff; work in psychiatry in India is of a pioneer character and demands energy, interest, and initiative. He especially singles out the able services rendered by Dr. J. N. J. Pacheco, the Deputy Superintendent.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, FOURTH ANNUAL REPORT TO THE COURT OF GOVERNORS, 1927-28.

NEWS of the London School of Hygiene and Tropical Medicine will always be of interest to our readers, and it is clear from this report that substantial progress is being made towards the completion of the new organisation of the School with regard to building, equipment, and teaching and research. The recently introduced advanced courses in bacteriology and immunology, and in epidemiology and vital statistics have been well established, and five students during the year gained the new Diploma in Bacteriology of the London University. The work in the division of epidemiology and vital statistics is largely interlocked with Professor Greenwood's work at the Ministry of Health and with that of the Statistical Committee of the Medical Research Council.

A special committee has been appointed to consider how best the old School of Tropical Medicine—now the Department of Tropical Medicine of the new School—can be fitted into the new scheme. The Seamen's Hospital Society have decided *not* to close the hospital in Endsleigh Gardens, and this famous hospital will continue to be associated with the new School. Hence the former suggestion for a new Imperial Hospital for Tropical Diseases has fallen into abeyance. Important appointments have been made to the chairs of biochemistry and of chemistry as applied to hygiene, which will be associated in one administrative division. The professor of public health has been appointed, and this department will also deal with physiology as applied to hygiene. A part of the capital as well as the interest of the Milner Research Fund is being applied to research work, and about one-sixth of the accommodation in the new building is being reserved for research work only. The Research Field Station at Salisbury in Southern Rhodesia is to be continued for another period of five years.

A School Council has been constituted on an academic basis, and will deal direct with the Board of Management. The Council is an advisory, not an administrative body. Dr. J. F. C. Haslam has been appointed Director, and Mr. R. L. Sheppard, Assistant Director of Library Services. Regulations relating to the conditions of appointment of whole-time staff of the School have been drawn up. The expenditure during the year was very close to that budgetted for; and the estimates for 1928-29 have been met by a Treasury grant of £25,000. An Equipment Committee

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is drawing up plans and estimates, and placing orders.

The annual meeting of the Court of Governors was held at the British Medical Association's House on November 30th, with Sir Holburt Waring in the chair. The Director (Dr. Andrew Balfour) presented his report and stated that there had been an increase of 17 per cent. in the proportion of students sitting for the Diploma in Tropical Medicine and Hygiene who were successful.

It is hoped that the new and very handsome building in Portland stone which is now nearing completion in Bloomsbury will be ready for a formal opening in the summer of 1929.*

KASHMIR C. M. S. MISSION HOSPITAL ANNUAL REPORT FOR 1928. BY DR. E. F. NEVE, M.D., C.M., F.R.C.S. ED.

THIS short annual report, with its excellent and interesting photographs, is always of interest. As far as we can recollect, it was a previous Viceroy of India the other day in a public speech who said that he had come out to India rather prejudiced against missions, but what he had seen of missionary work, and especially of medical missions in India, had made him a complete convert and enthusiastic supporter of them. Certainly medical missions in India have a magnificent pioneer record, and the Kashmir C. M. S. Hospital—run very largely by private subscriptions—is one of the most famous among the 200 odd which exist in this country.

Dr. Neve writes in an interesting manner of the necessity for the personal touch in medical mision work. Institutions do excellent work on a large scale, but it is often the personal reputation of the man in charge which brings in patients, and personal touring in the districts which brings a mission hospital into contact with the people. At various villages visited Dr. Neve tells of the crowds of patients who came to the tent dispensary; 400 at one, 800 at another. Lord Goschen (for years Chairman of Guy's Hospital), on visiting the Hospital wrote "In a large European hospital, with a large staff and specialised organisation, it should always be easy to achieve efficiency. But it is really remarkable, in this hospital, with its small but capable staff, how efficiently it is run, down to the smallest detail."

During 1928 expenditure largely exceeded income, owing chiefly to the building of a new house for nursing sisters. The income of the hospital is derived from four main sources; endowments for cots and beds; local donations and subscriptions—which have dropped from Rs. 12,000 or Rs. 13,000 to Rs. 10,000; fees from patients; and an annual grant of Rs. 10,000 from Kashmir State. Income from interest on reserve funds amounts to only Rs. 3,000 per annum, and as the total expenditure for the year was Rs. 56,724, it will be seen how very largely dependent is the hospital on donations and subscriptions. The income from fees has been much reduced by constant transfers of members of the staff to other places; this breaks up any chance of organising a general practice for the benefit of the hospital. (Although we are hearty supporters of medical missions in India, we confess that we have never heard anyone say a good word for missionary boards; there must be such organisations, of course, but they often fail to realise local conditions on the spot.)

A feature of the year unfortunately was the transfer of the Leper Hospital from control by the mission to the Kashmir State—which was effected whilst Dr. Neve was on leave; apparently without consulting him, and against the advice of the Director of Medical Services of the State. For thirty-six years Dr. Arthur Neve and Dr. Ernest Neve in turn have run this hospital in an honorary capacity, and most efficiently, the buildings being constantly added to, modern methods of treatment continuously introduced and improved upon, but "no acknowledgment whatever was made of 36 years' honorary work, including the foundation and organisation of the asylum."

Srinagar, "the city of the sun," has a population of 142,000, and the opportunities for medical and surgical work are enormous. Puerperal fevers, enteric fevers, and tuberculosis appear to be the three chief problems. Open air treatment is possible for nine months of the year—not only for cases of tuberculosis, but also for medical and surgical cases of all kinds. Kashmir most urgently needs a tuberculosis sanatorium; apparently the disease was almost unknown in Kashmir in 1890; "but during the last two decades it has been increasing by leaps and bounds"; and—an interesting point—nearly a quarter of the cases are of bovine origin. Osteomyelitis and tuberculous bone disease are very common. Cataract does not figure largely in the Kashmir returns, but entropion and trichiasis are important. Cancer occurs—chiefly of the Kangri-burn type—but is not very common. The detailed table of major operations shows that eye diseases (215) head the list, with bone and joint operations (208) second, and abdominal sections (84) third. "Tumours" of various sorts numbered 338, but included 133 cases of tuberculous glands. Vesical calculus cases only numbered 12.

"The best days of a man's life are those in which he renders service," quotes Dr. Neve from Abu'l Tarif; and certainly the well-known Srinagar Hospital continues to render most valuable service; it is a model of what it should be.

REPORT OF THE CHEMICAL EXAMINER TO THE GOVERNMENT OF THE PUNJAB FOR THE YEAR 1928. BY MAJOR D. R. THOMAS, M.B., Ch.B., I.M.S., LAHORE. SUPDT., GOVERNMENT PRINTING, 1929. PRICE, 10 ANNAS.

MAJOR THOMAS' reports are always interesting, and this one is no exception to the rule. Major H. S. Anand, I.M.S., held charge of the post of Chemical Examiner from the beginning of the year until October, when Major Thomas returned from leave and took over charge.

A table shows the steady increase in work in all departments from 1924 to 1928; this is true indeed of all chemical examiners' departments in India, and in the course of time must involve the creation of new laboratories. Medico-legal cases have increased from 1,202 to 1,705 in these years, and the total number of articles examined in the year from 5,133 to 7,129. Analysis for the Excise Department has now been taken over by the Chemical Examiner's department, and the work has roughly been increased by sixty per cent. in the last five years.

Human poisoning cases dealt with numbered 681 and poison was detected in 66 per cent. of them. Arsenic was also detected in the remains of a cremated body sent for examination. The chief poisons used are in order of frequency opium, arsenic, *dhatura* and mercury. Contrary to popular belief, powdered glass comes last on the list and was responsible for only one case. Animal poisoning cases numbered 55, and arsenic was the principal poison detected. Stain cases numbered 3,046, and blood was detected in 1,086. General analyses of miscellaneous articles numbered 1,744 and included samples of liquor, tinctures, cocaine, charas and opium. Only 38 out of 52 samples of ghee examined were found fit for human consumption. An interesting experiment was carried out with regard to ammonium sulphate as a fertiliser.

In Appendix I of the report, Major Thomas comments on the way in which medical officers send in viscera for chemical examination from cases where they have no reason to suspect poisoning, and where the true cause of death, e.g., pneumonia, is clear. If there are secret reasons for sending in these viscera, the medical officers concerned keep them to themselves.

This increases the work of the department unnecessarily, and means an increased number of unnecessary examinations and a decrease in the number of cases in which poison is detected.

The report contains the following interesting case reports:—

* This was opened by the Prince of Wales in July, 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

intestinal infections

In the tropics gastric and intestinal disturbances in one form or another such as sprue—enteritis—colitis—occur with monotonous regularity, usually from fly-infected milk.

In treating these conditions it is essential to prescribe a milk-food providing the necessary nourishment, without risk of irritation, or additional infection.

Glaxo answers this standard. It is guaranteed free from all harmful bacteria, and cannot become fly-infected if the lid is replaced after the required quantity is taken from the tin.

Glaxo is more easily digested than ordinary milk, because the process of manufacture changes the caseinogen so that in contact with the gastric juice, it forms—instead of the dense, leathery curd of cow's milk—a light, flocculent precipitate, which is non-irritant and easily absorbed.

Glaxo

The Vitamin Milk-Food

Literature and information will gladly be sent by

H. J. FOSTER & Co. Limited
P.O. Box 202, Bombay
P.O. Box 2257, Calcutta

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TO REDUCE BLOOD PRESSURE

ANABOLIN

May be given orally or intramuscularly
Vial of 15 tablets; boxes of 6 ampoules
on prescription only
Through your usual Chemist

ANABOLIN (An-ab'-o-lin)

A residue extracted from the liver by fractional solvent methods which stimulates hepatic detoxication and reduces high blood pressure.

Literature and further information from the Endocrine Laboratory, Simla.

ENDOCRINES LIMITED.

WATFORD, HERTS, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Barium Carbonate (rat poison).

A family in the Hissar District after eating some chapattis began to vomit and purge, exhibiting the symptoms of an irritant poison. A calf that was given a chapatti also became ill. On investigation it was discovered that some officials of the Health Department, who had recently visited the village in connection with rat destruction, had left behind some of the pills and a bag of atta. A young boy found these articles and took them to his mother who cooked the chapattis. On examination of the articles barium carbonate was detected.

Nitric Acid (Aqua fortis).

A young student in one of the Lahore Colleges, finding that he had failed in one of his subjects, shut himself up in his room and was found dead. A post-mortem examination was carried out and signs of poison were evident in the viscera. There was browning of the mucous membrane of the alimentary canal and the stomach was highly congested. Nitric acid was detected.

Arsenic (homicide).

A young unmarried daughter was found by her parents to be pregnant and in order to hush up the affair they had her removed to another village. Within two days of her arrival she died. A post-mortem examination elicited the fact that she was about five months pregnant and the congestion of the internal organs pointed to death from an irritant poison. Arsenic was found in all the exhibits sent for analysis. The police reported that she had had administered some poison to produce abortion.

Strychnine (accidental).

A very remarkable case is reported from Hoshiarpur district where a medical man gave some tablets supposed to be quinine to a family. The head of the family took four tablets, he also distributed three tablets each to four members of his family. They all became ill and suffered from convulsions. The head of the family died and his viscera on examination contained strychnine. The other members fortunately recovered. The tablets that remained were analysed and proved to be pure strychnine.

Strychnine (non-fatal).

A very mysterious case was sent from Delhi where a lady stated that she ordered six packets of a powder from a well established firm of chemists. She took one powder just before retiring to bed. In half an hour she felt her muscles stiffening and she had twitching movements. She woke up some of her neighbours and the medical man on his arrival found her a picture of strychnine poisoning. Drastic treatment was carried out and she recovered. The vomit was examined and 1.2 grains of strychnine were recovered. What powder remained in the glass was also examined and approximately 2 grains of strychnine were found. On examining the remaining five powders obtained from the chemist, no poison was detected and the ingredients conformed with the standards of the British Pharmacopœia.

Perforated duodenal ulcer simulating irritant poisoning.

The viscera of a young man were received with a history of pains in the abdomen, vomiting, diarrhœa and a post-mortem report of congestion of the stomach and intestine. The pathologist reported a perforation the size of a small button in the duodenum and on chemical analysis no poison was detected.

In a second Appendix to the report, Major Thomas gives certain most useful suggestions for police and medical officers regarding sending in exhibits. As these may be of importance to our readers, we here reproduce them. They are as follows:—

(1) All exhibits suspected to contain stains should be thoroughly dry before being packed and despatched for examination. The safest way of drying exhibits is to expose them to the sun. In cases of exhibits that become brittle on drying, they should be carefully packed in cotton-wool and then in a wooden box.

(2) Sharp-edged and pointed exhibits like swords, spears, etc., should be packed in boxes and not bound up into cloth packages. In their transit through the post they are liable to cut through the packing material and the exhibit is exposed.

(3) As far as possible no letters should be glued on to exhibits as they interfere with analysis.

(4) Exhibits in connection with cases of murder by hurt or violence may be sent direct to the Chemical Examiner. This saves time and relieves the office of the Civil Surgeon of the district of unnecessary correspondence.

(5) Endeavour to send all the exhibits in a case of murder by hurt or violence under one covering letter, thereby reducing the cost of examination, etc.

(6) Nail clippings are poor exhibits to send for the detection of blood in murder cases. No court of law could be expected to attach much weight to the finding of human blood on the nails of the accused.

(7) Stomach tubes in hospitals are frequently kept in a solution of mercury. They should be carefully washed with water before use. Traces of mercury found along with another poison in a stomach content, might produce such complications as would handicap the successful prosecution of a case.

(8) Carbon copies of reports are sometimes very difficult to read.

Correspondence.

LOBAR PNEUMONIA WITH INTERMITTENT TEMPERATURE.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Recently I have come across a case of lobar pneumonia with all the classical signs and symptoms of that disease, but with an intermittent temperature chart similar to that reported in your issue for June 1928.

From the very onset the case looked like one of malaria, with high but intermittent fever and delirium during the febrile phase. The patient had two injections of quinine bihydrochloride, but this did not affect the fever. On the morning of the third day of illness it was discovered that consolidation had set in in the base of the left lung, and this cleared up the diagnosis. The patient was treated as a straightforward case of pneumonia, and made an uneventful recovery.—Yours, etc.,

BHUPENDRA NARAYAN CHAKRABATTY,
Medical Officer.

ANGURSON CHARITABLE DISPENSARY,
P. O. PINCHIRA, BURDWAN DISTRICT,
25th May, 1929.

(*Note.*—We have seen similar cases with intermittent fever in cases where lobar pneumonia set in as a complication of malaria. Patients suffering from true malaria sometimes develop lobar pneumonia as a complication.—EDITOR, *I. M. G.*)

THE STERILIZATION OF HYPODERMIC SYRINGES.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—On p. 297 of your issue for May 1929, I was interested to read the letter by Dr. Jyoti Dhur Roy on sterilization of hypodermic syringes, and your comment on the same. Of course any method short of boiling is not ideal for perfect asepsis, but I have found the following method perfectly safe and speedy in more than a thousand subcutaneous injections of various medicaments in practice.

I carry a small spirit lamp in my injection case, together with an aluminium spoon of sufficient size to boil the *needle only* of the syringe. The syringe with needle *in situ* is boiled and then kept for use in a metal case (procured from Messrs. B. P. Vara and Co., Bombay) in rectified spirit. Before giving an injection the needle only is boiled in the aluminium spoon over the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

flame of the spirit lamp, whilst the syringe is sterilised by drawing rectified spirit into it and again emptying it into the metal case. Needle and syringe are then fitted together and are ready for use.

I have never seen abscess formation or even swelling in using this method, and it is in my opinion both safe and rapid. I may add, however, that I have only used it for hypodermic and intramuscular injections; for intravenous injections I always boil both the syringe and needle.—Yours, etc.,

C. S. SHARMA, L.M.P.,
Medical Officer in Charge.

KAIMGANJ DISPENSARY,
FARRUKHABAD DISTRICT,
6th May, 1929.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the query on p. 297 of your issue for May 1929, with regard to the sterilization of hypodermic syringes, in my experience chloroform is the most rapid and useful means of sterilization for any type of syringe, including the "Record" pattern. I have given a few thousand subcutaneous, intramuscular, and intravenous injections, using this method, and have seen no bad results. The method is as follows:—

Pure chloroform is taken into a clean drachm glass, and a small quantity of it is drawn into the syringe through the needle and brought into contact with the whole of the inside of the barrel of the syringe and then ejected, repeating this process about five times at most. The needle and the adjoining part of the barrel are dipped into chloroform for a few seconds; similarly the other end of the barrel and then the piston are dipped into chloroform. The chloroform rapidly dries up by waving the parts of the syringe in the air, and they are then fitted together and ready for use.

With this technique I have never seen sepsis in some thousands of injections. I have often used the same syringe to give injections to five or six consecutive patients, sterilizing it with chloroform between the injections. After the injection is given the syringe is rinsed out with methylated spirit, dried with a clean towel, and replaced in its case. Syringes of 10 and 20 c.c. capacity are sterilized in the same manner.—Yours, etc.,

M. SUBBIAH, M.B., B.S.

SRIRANGAM,
25th May, 1929.

INDIGENOUS MEDICINE AND DISTRICT BOARDS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I should like to protest most strongly against the employment of unregistered practitioners (*vaids* and *hakims*) by district boards and municipalities. As I am a taxpayer to both these bodies, I object to see my hard-earned money wasted in this fashion. The old excuse that registered medical practitioners are not available is no longer true in these days, when even M.B., B.S. graduates in Indian universities are willing to settle down as practitioners in rural areas on a small subsidy. There are some things that they cannot do however, and they are to dance attendance on those who make such appointments, or issue bogus certificates; hence their unpopularity.

Medicine has always been a State subject in India since time immemorial, and it is difficult to understand the present-day policy of multiplying medical schools and institutions, without finding employment for the host of graduates turned out, and—at the same time—indirectly helping quacks through the agency of district boards and municipalities.—Yours, etc.

D. BHARADWAJA, L.R.C.P., L.R.C.S. (Ed.), L.R.F.P. & S. (Glas.).

GANGOH,
SATARANPUR,
3rd June, 1929.

A CASE FOR DIAGNOSIS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the case of hyperpyrexia for diagnosis recorded in your issue for May 1929, p. 260, by Drs. Pereira and D'Cruz, I suggest that the case was probably one of typhoid fever. All the symptoms and signs, viz., the temperature, slow pulse rate, headache, drowsiness, and tympanitic abdomen, point to it. I have seen cases here where the Widal reaction was reported as negative even up to the 30th day of illness, and positive thereafter at 1 : 100 or higher dilution. The negative agglutination test in this case appears to have been observed about the 17th day of illness. Tice, in his *Practice of Medicine* (1927), Vol. IV, p. 503, says that "while a positive result is highly presumptive of typhoid, a negative finding has no significance." There is a temperature chart on p. 484 of the same volume illustrating such a case, where the Widal reaction was negative on the 8th and 15th days and positive on the 47th day. It is possible therefore that the Widal reaction might have become positive in this case at a later stage. The hyperpyrexia and meningeal symptoms suggest complications of typhoid fever. It appears to be most unlikely that the case was one of malaria, as so much quinine was administered without affecting the fever. The blood film was also reported to show no malaria parasites.—Yours, etc.,

CH. KRISHNAMURTY, L.M.P.,
Sub-Assistant Surgeon.

CENTRAL JAIL, RAJAHMANDRY,
28th May, 1929.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the case of hyperpyrexia for diagnosis recorded on p. 260 of your issue for May 1929, I suggest that the case may have been one of cerebral abscess following chronic middle ear disease. The patient showed the following symptoms:—

Slight headache, occasional vomiting, a continuous temperature of from 99°F. to 101°F., slight drowsiness, general malaise for about six weeks, a slow pulse during the whole course of the illness, 90 with a temperature of 101°F., and 97 with a temperature of 104°F., hyperpyrexia at the terminal stage, twitching of the right upper and lower extremities, a lumbar puncture with negative results, a negative Widal reaction, and no response to quinine administration.

Let me now enumerate the points in favour of cerebral abscess following on otitis media, whether of cerebral or cerebellar type. In such cases headache is rarely absent; optic neuritis is less frequent than in cerebral tumour (in the present case the fundus was not examined); the mental changes are drowsiness, apathy, later stupor, and coma. Vomiting and vertigo are chiefly seen in cerebellar cases. The pulse is often slow, in the terminal stages rapid or irregular. The temperature in latent and uncomplicated cases is usually normal or subnormal, but rises very high in the terminal stages with sinus thrombosis or rupture into the ventricle. Respiration is often slowed down, especially in the cerebellar types. Leucocytosis is often marked, but is not invariable.

Considering all these points, I believe that the patient probably had a cerebral abscess of the left side, resulting from chronic otitis media.—Yours, etc.,

S. P. SARBADHIKARI, L.M.S.

MIDNAPUR,
8th June, 1929.

THE TREATMENT OF ACUTE VAGINISMUS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—In reply to the enquiry in the correspondence columns of your May issue, on the treatment of acute vaginismus I hasten to assure your correspondent that the only "radical" cure for this distressing complaint is psycho-analysis. There can be no doubt whatever that vaginismus is essentially a psychic manifestation of the lack of psycho-sexual adaptation to a partner and the fundamental cause of this disturbance is an incestuous father-fixation during infantile sexual development. Such a condition can only be treated by psycho-therapy, and psycho-analysis is the one and only certain and justifiable measure to unearth the complex from the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Preparations

FOR THE USE OF

THE MEDICAL PROFESSION

LIQ. BISMUTHI "SCHACHT."

Absolutely pure and perfectly stable. The original preparation and the most physiologically active solution of Bismuth. Dose: One drachm, diluted.

PEPSINA LIQUIDA "SCHACHT."

A palatable, standardised solution of gastric juice from the pig. Useful in the treatment of dyspepsia. In ten-minim doses it gives excellent results in infantile diarrhœa. Adult dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO "SCHACHT."

Each fluid drachm contains in a concentrated form, besides the Pepsina Liquida, one fluid drachm of Liquor Bismuthi "Schacht." Dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO CO. "SCHACHT."

Contains one grain of Soluble Euonymin in each fluid drachm, in addition to the Pepsine and Bismuth. Dose: One drachm diluted.

BISEDIA.

A combination of Schacht's Liquor Bismuthi and Pepsina Liquida, with Morphia and Hydrocyanic Acid. Of the greatest value in the treatment of Acute Dyspepsia, Gastric Ulceration, Vomiting of Pregnancy, etc. Dose: Half to one drachm, diluted.

LIQ. CASCARÆ DULCIS "SCHACHT."

A palatable and very concentrated aromatic preparation of the finest Cascara Sagrada; free from bitterness and griping action. Dose: Quarter to one drachm.

LENIVA.

An excellent fruit laxative syrup, containing Alexandrian Senna, Figs, Prunes, Tamarinds, etc. Eminently suitable for delicate women and children. Dose: Half to two drachms according to age.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
BRISTOL, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TRADE 'DIONIN' MARK

ANALGESIC—SEDATIVE—ANTISPASMODIC

Since its introduction to the medical profession in 1898, 'Dionin' has gone on increasing in prestige as an analgesic, sedative and antispasmodic of pre-eminent value in the treatment of respiratory affections.

'DIONIN' is of outstanding merit.

Whilst it may be considered the most innocuous of the morphine derivatives it possesses powerful analgesic properties which afford prompt relief in painful conditions; even in large therapeutic doses it does not lead to habit formation or to untoward effects such as nausea, constipation, etc.

DIONIN IS INDICATED IN

ASTHMA, BRONCHITIS, CORYZA, RHINITIS, WHOOPING COUGH, EMPHYSEMA, and in all cases where a safe, reliable sedative is required.

PACKING *Tablets 0.03 gm. in tubes of 20*
Powder in bottles of 1, 5, 10 and 25 gm.

E. MERCK CHEMICAL WORKS DARMSTADT

Represented by Messrs. MARTIN & HARRIS Ltd., CALCUTTA, BOMBAY, MADRAS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

deeper layers of the unconscious. Practitioners in general, and gynæcologists in particular, are ever ready to suggest all manner of unnecessary surgical interference, with the result that Pelion is piled upon Ossa. The condition is curable and I would advise that the case be shown to a mental specialist.—Yours, etc.,

J. NORMAN PACHECO, M.R.C.S., L.R.C.P., I.M.D.,
Officiating Medical Superintendent.

RANCHI EUROPEAN MENTAL HOSPITAL,
KANKE (RANCHI),
22nd May, 1929.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the case of acute vaginismus recorded in the *Indian Medical Gazette* of May 1929, I beg to suggest the following treatment:—

"Induction of general anæsthesia, dilatation of the introitus vaginæ, and excision of the ring of tissue which is the remnant of the hymen. Hæmorrhage may be profuse and it is always desirable to tie all bleeding vessels and insert a tampoon filling the entrance of the vagina. This is the treatment suggested by Sajous in his *Analytic Cyclopædia of Practical Medicines*."—Yours, etc.,

SHYAM LAL, B.A., M.B., P.M.S.,
In-Charge, District Hospital.

LAKHMIPORE, KHARI,
29th May, 1929.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—In reply to Dr. Roy's letter published in your May issue, I beg to quote a few lines from Guerensey's *Obstetrics*.

"The treatment should be conducted according to homœopathic principles. The use of the knife, formerly so freely resorted to, is now generally denounced by practitioners, while the very questionable procedure of dilating the canal by graduated dilators, although claimed to be very successful, does not appear to be necessary. Should the vaginismus be dependent upon some local difficulty or disease, that must be removed before we can hope to accomplish a satisfactory and permanent cure. Coitus should be strictly prohibited, and all excitation of the parts by motion should be avoided by enjoining perfect rest. Lavements of tepid water will be found very grateful.

In vaginismus the diet should be strictly attended to. All use of coffee, tea, spirituous liquors, stimulants and spices of all kinds should be positively prohibited. As much out-of-door exercise should be taken as possible."—Yours, etc.,

J. N. BANERJI.

116A, HARISH MUKERJI ROAD,
BHOWANIPORE, CALCUTTA,
21st May, 1929.

HÆMOPLASTIN.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the notes by Dr. K. P. Lahiri on p. 256 of your issue for May 1929, on the use of Hæmoplastin (P. D. & Co.), I may perhaps be permitted to record my experience with this preparation.

I have used Hæmoplastin in three cases of severe epistaxis, and in two of pulmonary hæmorrhage. Whilst it proved extremely successful in the first three cases, it failed to stop the bleeding in the last two. Its effect in severe epistaxis, however, is admirable.—Yours, etc.,

M. BAROOA, L.M.P.

MANCOTTA TEA ESTATE,
DIBRUGARH, ASSAM,
31st May, 1929.

Service Notes.

APPOINTMENTS AND TRANSFERS.

COLONEL J. D. GRAHAM, C.I.E., I.M.S., Public Health Commissioner with the Government of India, has been elected by the Indian Research Fund Association as the representative of the Association on the Advisory Board of the Imperial Council of Agricultural Research constituted under the Government of India Resolution No. 826-Agri., dated the 23rd May, 1929.

Lieutenant-Colonel H. E. Stanger-Leathes, I.M.S., Assistant Director of Public Health, Delhi, is appointed Deputy Director-General, Indian Medical Service, with effect from the 5th July 1929, or the date on which he assumes charge of the post.

Lieutenant-Colonel W. J. Simpson, I.M.S., an Agency Surgeon, is posted as Chief Medical Officer in Central India and Residency Surgeon, Indore, with effect from the 14th June, 1929.

On return from leave the services of Major J. M. R. Hennessy, I.M.S., are placed at the disposal of the Government of India in the Department of Education, Health and Lands.

Major J. B. Hance, O.B.E., I.M.S., Chief Medical Officer in the Western Indian States Agency and Residency Surgeon, Rajkot, on return from leave, resumed charge of his appointment, with effect from the 4th June, 1929.

Major L. K. Ledger, I.M.S., an Agency Surgeon, on return from leave, is posted as Agency Surgeon in Bundelkhand, with effect from the 21st May, 1929.

LEAVE.

Lieutenant-Colonel J. R. J. Tyrrell, I.M.S., an Agency Surgeon, is granted leave on average pay for 3 months and 9 days, under the Fundamental Rules, with effect from the 14th June, 1929.

Lieutenant-Colonel H. M. H. Melhuish, D.S.O., I.M.S., Director of Public Health for the Government of Bombay, is granted an extension of leave, out of India, on average pay for 2 months and 24 days, followed by leave on half average pay for 16 days in continuation of the leave granted to him in Government Notification No. S. 20|16, dated the 28th January, 1929.

Lieutenant-Colonel H. H. Thorburn, C.I.E., M.B., I.M.S., Surgeon to His Excellency the Viceroy, is granted leave on average pay for 4 months, with effect from the 30th June, 1929.

Lieutenant-Colonel R. B. Seymour Sewell, I.M.S., Director, Zoological Survey of India, is granted study leave for 5 months in continuation of the leave on average pay for 5 months sanctioned in Education, Health and Lands Department, Notification No. 29-Z.S., dated the 28th March, 1929.

Major J. B. Hance, O.B.E., I.M.S., Chief Medical Officer in the Western India States Agency and Residency Surgeon, Rajkot, was granted leave on average pay for 42 days, under the Fundamental Rules, with effect from the 23rd April, 1929.

PROMOTIONS.

Colonel to be Major-General.

J. W. D. Megaw, C.I.E., M.B., V.H.S., I.M.S.

Lieutenant-Colonel to be Colonel.

H. M. Mackenzie, M.B., I.M.S.

Majors to be Lieutenant-Colonels.

G. B. Lynn, D.S.O., M.B., I.M.S. Dated 31st January, 1929.

M. A. Rahman, I.M.S. Dated 31st January, 1929.

Captains to be Majors.

G. M. Moffat. Dated 14th May, 1929.

L. G. Pearson, M.B. Dated 18th May, 1929.

P. M. Antia, M.B. Dated 23rd May, 1929.

Lieutenant to be Captain.

Mohan Lal Ahuja, I.M.S. Dated 11th May, 1929.

RETIREMENTS.

Colonel R. F. Baird, I.M.S., from the 16th March, 1929.

Lieutenant-Colonel W. M. Anderson, C.I.E., M.D., I.M.S., from the 29th December, 1928.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

NOTES.

WATSON'S *MICROSCOPE RECORD.*

WE have referred to this most interesting journal in these columns previously, but make no apology for returning to the subject. Whilst admittedly a "trade journal" it is full of interesting matter to the microscopist, and laboratory and research worker, and may be obtained free on application to Messrs. W. Watson & Sons, Ltd., 313, High Holborn, London, W. C. 1.

The issue for January 1929 contains several important features. A. E. Clarence Smith deals with the problem of exposure in photomicrography, and discusses the relationship of density to exposure; this is an article which will interest all those who have photomicrographs to prepare. Mr. H. E. Hurrell, F.R.M.S., discusses the fresh water Polyzoa, and the Rev. D. P. Fuge the genus *Cosinodiscus* among the diatoms; in this genus there are some 300 species and the genus is of importance in standardising microscopic measurements. A most useful essay is one by A. A. C. Eliot Merlin on "Hints to Beginners"; his remarks with regard to the Abbé sub-stage condenser are very sound; the fixed non-centering sub-stage condenser is deservedly popular, but it is *not* the ideal fitting for getting the best value out of a good oil immersion lens. The fine adjustment is a part of the microscope which is at present in a very experimental stage; lateral fine adjustments have replaced the old fashioned central ones, but it is doubtful whether the change is for the better; what is wanted is a fine adjustment which will have to bear only the weight of the triple nosepiece and objective, and not that of the whole body and coarse adjustment as well. Even the microscope mirror is probably capable of improvement, and rustless steel may one day come to replace silvered glass. The editor of the *Record* discusses how to get the best out of the Abbé illuminator, and Mr. Chapman Jones the methods of testing objectives. "Notes and Queries" is a section which shows how popular the *Record* is; we are ourselves indebted to it for an authoritative opinion that "photomicrograph" is correct, and "microphotograph" wrong. We had come to the same conclusion from a study of recent journals.

Wonderful as are present-day microscopes, with their binocular vision and many other recent improvements, yet the instrument is still in the experimental and transitional phase, and future years may see many improvements. (For example, we know one enthusiast who has been for years trying to devise an automatic mechanical stage—which would move a blood film automatically at slow speed backwards and forwards under the oil immersion objective, and could be stopped the instant that one saw a suspicious object for study. Up to the present, he has not succeeded, as far as we know.)

The *Microscope Record* is a real help to laboratory workers, and a journal which should be widely known.

NEW AMŒBICIDAL MEDICAMENT.

A FURTHER addition has recently been made to the list of amœbicidal agents issued by Burroughs Wellcome & Co., Snow Hill Buildings, London, E. C. This medicament is described as "Kharophen," an acetyl derivative of 3-amino-4-hydroxyphenylarsenic acid and is obtainable as a "Tabloid" product. Clinical reports indicate that "Kharophen" is of value in the treatment of amœbic dysentery. It is administered by the mouth as "Tabloid" "Kharophen" gr. 4 twice a day for a course of 10 days.

The makers claim that "Kharophen" has a considerable advantage over other amœbicidal agents, especially emetine, in that it is definitely tonic and non-depressant. It is stated to have a marked hæmatinic action, and patients show a distinct improvement in their general health at the conclusion of the course of treatment, in addition to the disappearance of dysenteric signs and symptoms. The absence of undesirable action, and the general tonic effect give this substance obvious advantages in the treatment of children and debilitated patients. "Kharophen" is eminently suitable for use in out-patient work, in dispensaries in the field, and in remote areas out of touch with medical treatment.

"Kharophen" has been used effectively in the treatment of yaws (framboesia), both in adults and in children.

"Tabloid" "Kharophen" is issued in bottles of 25 gr. 4 products.

FIFTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, BRITISH MEDICAL ASSOCIATION HOUSE, LONDON, MAY 6TH TO 10TH, 1929.

EFFECTIVE dioramas depicting the exploits of Scott and Peary were prominent features at the stand of Burroughs Wellcome & Co., in the Exhibition held in connection with the Congress. The actual cases carried by these and other notable pioneers were in view and attracted considerable interest.

A comprehensive range of "Tabloid" and "Soloid" medicine cases was displayed. The unique construction of these outfits is the result of many years' experience and ensures the utmost compactness and portability with medicaments which retain their potency under any climatic condition.

A characteristic selection of "Wellcome" brand sera, vaccines, tuberculins, and serological products was shown. These preparations are made and biologically standardised at The Wellcome Physiological Research Laboratories. They include Schick and Dick test products, concentrated scarlet fever anti-toxin globulins, diphtheria prophylactic, anti-gas-gangrene serum (W), etc.

Among the more recently introduced medicaments shown may be mentioned "Tabloid" ephedrine hydrochloride (prepared from genuine *Ma Huang*), "Wellcome" liver extract, "Wellcome" insulin, "Hypoloid" quinine and urethana, and "Hypoloid" sodium salicylate for intravenous injection in the treatment of varicose veins; "Quinoxyl" for amœbic dysentery, "Alepol" for leprosy, and "Avenyl" for leprosy associated with syphilis.

There were also specimens of medicinal plants exhibited which were typical of those specially grown on the Wellcome Materia Medica Farm for the preparation of Burroughs Wellcome & Co. products. Many old and well tried products were also in evidence, presented with that pharmaceutical refinement characteristic of Burroughs Wellcome & Co.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers, relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India, Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

KURCHI BISMUTHOUS IODIDE, ITS VALUE IN THE TREATMENT OF CHRONIC AMŒBIC INFECTIONS OF THE BOWEL.

By HUGH W. ACTON,
LIEUTENANT-COLONEL, I.M.S.,
Director and Professor of Pathology and Bacteriology,
and
R. N. CHOPRA, M.A., M.D. (Cantab.),
LIEUTENANT-COLONEL, I.M.S.,
Professor of Pharmacology, Calcutta School of Tropical Medicine and Hygiene.

INTRODUCTION.

Holarrhena antidysenterica belongs to the natural order Apocynaceæ, and is a small deciduous tree with white flowers. There are many Sanskrit names for it, the better known being *kutaja* and *kulinga*. The other vernacular names are Bengali *kurchee*, Hindi *kureya* and *dudhi*, and Tamil *kulappalai*. The seeds are called in Sanskrit *indrayava* or Indra's seeds, in Hindi *indrajaba*, and in Persian *indrajavatalkh*. The reason why these seeds have been named after the god Indra is due to the following mythological story. The god Indra came to the aid of Rama before they crossed over to Lanka (Ceylon) and defeated the king and demon Ravana in a great battle. After a fight in India, the god Indra noticed the large number of Rama's soldiers, i.e., the monkey army of Hanuman, who had been slain during the fight. Indra in compassion restored them to life by sprinkling *amrita*, or the water of life, over the dead monkeys, and the drops that fell on the ground became the seeds *indrayava* from which this plant sprang into being.

The tree grows well up to 3,500 feet, and is found in all the lower hilly tracts from the Himalayas to Travancore. *Holarrhena antidysenterica* is often mistaken for another species of the same family, viz., *Wrightia tinctoria;* in fact Linnæus was originally responsible for this confusion. In 1809 Brown revised the whole of the family of Apocynaceæ and rectified this mistake. In spite of this the two plants have been mistaken one for the other. *Wrightia tinctoria* is inert, and it is largely owing to this fact that *Holarrhena antidysenterica* did not attract much attention, because more often than not the inert bark was used instead of the active Holarrhena. The following points will serve to distinguish the two plants. In *Holarrhena antidysenterica*, the bark is thick, dirty white or buff coloured, and very bitter to the taste. The seeds are oat-shaped and have a tuft of hair on the end remote from the foot stalk, they are very bitter and are contained in long follicles, the thickness of a quill. The flowers are odourless. In *Wrightia tinctoria*, the bark is thinner, reddish brown in colour and of a smooth appearance; in the seeds the tuft of hair is next to the foot stalk; the flowers are white jasmine-like with a fragrant odour.

The value of *Holarrhena antidysenterica* has long been known to the indigenous systems of medicine in India as a cure for dysentery. Kanai Lall Dey (1896) was so struck with its therapeutic value that he advocated that it should be included in the British Pharmacopœia. Recently Lieut.-Col. R. Knowles (1928) reported the value of "Tabloids" of extract of kurchi bark in the treatment of amœbic dysentery. As regards the active principles of the bark, in 1858 Haines first isolated an alkaloid which he named "conessine." In 1880 R. C. Datta in collaboration with R. D. Ghosh isolated an alkaloid which they named "kurchicine" and gave 2 to 5 grains as a dose in the treatment of dysentery. Pyman (1919) isolated two alkaloids, conessine and another which he named "holarrhenine." More recently Drs. Sudamoy Ghosh and N. N. Ghosh (1928) isolated three alkaloids from *Holarrhena antidysenterica*, viz. conessine, an alkaloid differing from holarrhenine, which they named "kurchicine," and a third with a low melting point—"kurchine." Chopra, as the result of his researches from the pharmacological point of view, commenced using the total alkaloids of kurchi bark, which we will speak of as "kurchi alkaloids," in the treatment of acute amœbic infections by intramuscular injections.

This paper illustrates the value of combined team work of the bacteriological and pharmacological departments; both laboratories were working at the same subject but from totally different points of view, until their interests became identical, i.e., the discovery of a more efficient remedy. The more experience one has in the working of large research institutes, the firmer does the conviction grow that the time has now passed for isolated and detached workers. Co-operation in an institute is the only possible way to save an enormous amount of waste of time and energy, as the workers are all housed in the same building and can obtain constant help and advice from each other, as they are experts on their own subjects. Thus we were saved the trouble of working up the technique of cultivating *Entamœba histolytica*, for Lieut.-Col. R. Knowles supplied us with these cultures. Dale and Dobell (1917) first showed the value of emetine bismuthous iodide in the treatment of chronic amœbic infections, and got constant curative results by their method of treatment. Their results hold good when dealing with young soldiers in England, but the drug is not so successful when dealing with the class of case we have to treat in India. Knowles (1928) clearly brings this point out in his paper by the numerous failures he had with all the different combinations of emetine he used in the treatment of these chronic cases.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Acton (1921) first pointed out the importance of the pH of the solute on the behaviour of *Paramœcium caudatum* towards the cinchona alkaloids. At that time he performed similar experiments with emetine; these were not published, but he found that emetine like quinine was ten times more powerful in its action in an alkaline substrate of a pH of 8 than in an acid one of a pH of 6. During the War, Acton also noted the marked acidity of the stools in cases of acute amœbic dysentery when tested by litmus paper. Later Knowles Napier, and Das Gupta (1923) worked this point out, estimating the pH of the stools in these cases in detail and with more accurate methods. Naturally Acton regarded the failures in treatment by emetine as due to the alkaloid not being in a sufficient concentration in the acid contents of the large gut. The stools in these cases were usually between a pH of 5 and a pH of 6; this meant that the emetine would have to be in a concentration of 1 : 8,000 to 1 : 10,000 to be effective on the amœbæ in this substrate. We first tried to remedy the acidity of the bowel by giving by the mouth large doses of bismuth carbonate as recommended by Deeks, but we found this treatment was not successful in bringing about a complete cure. Acton next commenced to try and ascertain the reason of the increased acidity of the stools, and gradually accumulated sufficient evidence to incriminate the following organisms. Most commonly there was a streptococcal infection present, shown by the numerous fine colonies seen on the glucose Conradi plates; next in frequency a co-existing bacillary infection due to the *B. dysenterica* (Flexner or Strong); and lastly, other acid-producing organisms such as the *B. lactis ærogenes, B. acidi lactici,* etc. A different line of treatment was then started by him in those cases which had failed to be cured by a course of emetine bismuthous iodide. These patients were first given a course of autogenous vaccine made from the particular organism isolated from the stool—usually a streptococcus or Flexner's bacillus, and after completing three weeks of immunisation were then given a course of emetine bismuthous iodide. This modification of treatment cured every case that failed to be cured by emetine bismuthous iodide alone. The combination of a vaccine and emetine therapy is not a very practical one in India, however, as vaccines can only be prepared in the main laboratories, and hence people in the districts would always have to come to the larger towns for treatment. Chopra and his co-workers were investigating the action of the different alkaloids of kurchi bark (*Holarrhena antidysenterica*), and found that the total alkaloids of this bark were just as powerful in their action on cultures of *Entamœba histolytica* as conessine. This was an important finding, as it meant that we could use a mixture of these alkaloids which would be easier to obtain in larger quantities and therefore cheaper than isolating one alkaloid like conessine.

They observed that the total alkaloids of kurchi were more powerful in their action on cultures of *Entamœba histolytica* than emetine, and moreover the total alkaloids of kurchi bark had no emetic or irritative action on the gut and did not depress the heart. Chopra then commenced to use the total alkaloids, giving them by subcutaneous injections in cases of acute amœbic dysentery. The results were more striking than with emetine, yet failures still occurred in spite of the treatment. In one of the cases of failure, the bacteriological laboratory isolated the *B. dysenterica* (Flexner), and after a course of vaccine the total alkaloids of kurchi bark were again given and the patient was cured by the combined treatment. As the total alkaloids of this bark, which we will call "kurchi alkaloids," have no emetic action, and only slightly lower the blood-pressure, it is possible to give them in much larger doses than is feasible with emetine. Acton suggested that as potassium bismuthous iodide forms an insoluble bismuthous iodine compound with all alkaloids, a kurchi bismuthous iodide could be prepared which would be insoluble until it came into the large intestine, and by increasing the dose a greater concentration of these alkaloids could be attained, sufficient to overcome the hindering action of the acidity in the large intestine. In the first case treated, we commenced with two grains and gradually increased the dose until four grains of kurchi bismuthous iodide were given twice a day. The dose is given early in the morning and the last thing at night in order to avoid ionisation occurring, as the stomach contents may be acid in reaction. The dose is well tolerated; there is no appreciable effect on the pulse rate or blood-pressure. The depressant, emetic or intestinal irritation that is usually caused by emetine was not observed by us. If cures only took place with the same certainty as with emetine, we would have a safe and efficient drug in these kurchi alkaloids, that would replace emetine in the treatment of amœbic infections of the bowel.

We here publish our first series of twenty cases in comparison with those obtained by Lieut.-Col. Knowles in his series with emetine. The results are much better for the kurchi series that have been given from 8 grains upwards a day. Time and a larger experience will enable us to fix more definitely the duration of treatment and the dose necessary to cure every case without resort to vaccine therapy. We will then be able to treat these carrier cases in the out-patient department instead of admitting them into hospital, and no longer need insist on complete rest during the course of treatment. Rest in bed will be essential in the acute and subacute cases where deep ulceration must be always present. So far as we have observed the kurchi alkaloids are as powerful in non-suppurative hepatitis as emetine, but we have had no experience with liver abscess. The value of independent research on the same disease is now apparent when viewed from two different aspects. Acton was obsessed with the dictum of his teacher, Sir James Kingston

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Fowler, K.C.V.O., viz., that the failure of a specific remedy was not due to any fault of the drug, but to the person who administered it. Therefore he concentrated all his efforts to find out the cause of failure of emetine and emetine bismuthous iodide in the treatment of amœbic infections of the bowel. Chopra, on the other hand, was working on indigenous drugs, and found that the total alkaloids of kurchi bark gave better results in the laboratory on cultures of *Entamœba histolytica* than emetine. As soon as clinical failures occurred in the kurchi alkaloid series, one worker was able to help the other with his knowledge of the cause of failure. The low toxicity of the kurchi alkaloids enabled us to overcome the hindering effect of the acidity in the larger gut by increasing the dose and thus attaining a greater concentration of these alkaloids, and so making cures more certain.

Pharmacological action.

Chopra and his co-workers (1927) worked out in detail the pharmacological action of conessine on amœbæ, etc. Previously in 1922 Brown had shown that conessine had a marked amœbicidal action in every way equal to emetine, but had no effect on the organisms of bacillary dysentery. In 1914 Burn investigated the pharmacological action of conessine, oxyconessine, and holarrhenine. He found that conessine exerts a considerable narcotic effect on frogs but has no appreciable effects on mammals. According to him both conessine and holarrhenine are cardiac poisons causing the heart to come to a standstill. These alkaloids, when injected intravenously, cause heart block and have a particularly destructive effect on the auriculo-ventricular bundle. In small doses, both these alkaloids produce a rise of blood-pressure when injected intravenously both before and after paralysing the vaso-constrictor endings with ergotoxin. This statement of Burn's on the action of conessine on the heart muscle, if it were true for the total alkaloids, would make one hesitate to administer them in large doses. Any limitation in the dose would defeat the end we had in view, i.e. to attain a concentration of these alkaloids in the large intestine sufficient to kill the amœbæ in spite of the acidity that was present in the gut content or in the surface tissues. We therefore investigated the action of these alkaloids very thoroughly and in detail, and found as follows:—

(*a*) *On the circulation.*—Small doses, 2 mgms., injected intravenously into the saphenous vein of a cat weighing 2 kilos., caused a persistent fall of blood-pressure, but without any alteration in the intensity or frequency of the heart beat. In much larger doses, there was slowing of the heart beat. Perfusion through the isolated heart rarely showed any effect on the frequency or force of the contraction. Doses of 2.5 mgms. in a cat of 2 kilos. showed no alteration in the auricular and ventricular contractions as seen in myo-cardiographic tracings. Although there is a marked rise in pulmonary pressure with conessine and holarrhenine, the rise is only slight when the total alkaloids are injected into the animal. As the fall in blood-pressure is not due to a direct action on the heart or heart muscle, we next proceeded to study where the dilatation of the vessels occurred in the body.

(*b*) *The volume of various organs and structures in the body.*—We found that the limb volume, and that of the liver, spleen and kidney were all decreased after intravenous injections of the total alkaloids, indicating that vaso-constriction was occurring at these sites. On the other hand, there was a very marked increase in the intestinal volume with complete inhibition of intestinal movements; this was recovered from after a few minutes. From these results we concluded that the fall in blood-pressure is due to the dilatation of the intestinal vessels and to a lesser extent to engorgement of the lung.

(*c*) *Local effects on intramuscular or subcutaneous injections.*—When a 6 per cent. solution was injected into the tissues no hæmorrhages or necrosis was observed, but a good deal of œdema at the site of the injection. The œdema was most marked after 4 hours and began to disappear after 24 hours and disappeared completely in 48 hours after the injection; most of hyperæmia and œdema was caused by the acidity of the salt of the alkaloids.

(*d*) *On the uterus.*—The total alkaloids have very little effect on the excised uterus or on the uterus in situ except in strong concentrations which it is impossible to attain in the circulating blood. The alkaloid kurchine with a low melting point is the most powerful, causing contractions in a concentration of 1 : 50,000. Most alkaloids circulate in the blood at a concentration of 1 : 150,000 to 1 : 500,000. Therefore these alkaloids would have no effect if given to a pregnant woman.

Although our experience is somewhat limited, we can state the following facts from our clinical experience. There is no emetic or depressant effect when 20 grains of the kurchi bismuthous iodide are given daily for 10 days. The pulse remains normal in frequency, tension and rhythm. There is no alteration in the heart sounds, even in a case of cardiac disease. The drug does not cause irritation of the alimentary canal with diarrhœa as does emetine. If diarrhœa does occur, there is generally a reason such as a co-existing bacillary infection by the *B. dysenterica* (Flexner or Strong).

Injections into the muscles.—One- to two-grain doses of the total alkaloids give rise to no signs of bruising (hæmorrhages), as is seen with emetine, or necrosis as with quinine. Further, there are no general symptoms of mental depression.

Treatment by the total alkaloids of kurchi bark injected intramuscularly.

The total alkaloids of this bark do not cause any marked local reaction or necrosis of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tissues, other than a slight and transient œdema. Chopra commenced to use this drug in the treatment of acute *Entamœba histolytica* infections by injections into the tissues. The toxic effects of these alkaloids were unknown in man, so he decided to give the same dose, e.g. one grain, as is given for emetine.

Muscles.—The local effects were found to be practically nil, no hæmorrhage, pain, or local swelling were observed such as occur with emetine, unless these alkaloids are injected superficially when there is slight congestion and swelling. Patients who had experienced the effects of intramuscular injections of emetine and of these alkaloids of kurchi bark commented on the difference in the local reactions of the two drugs. Moreover, as the accumulative effect of these alkaloids was not known, the cases were at first treated by giving six consecutive doses followed by two or three days' rest, and then giving another three doses making a total of nine doses. Unfortunately to test the curative value of these alkaloids on these acute cases, we had to rely on a smaller number of examinations than some may think to be sufficient for the test. In a civil population one cannot carry out Utopian ideals, that insist on at least six weekly examinations of the stools before one can say with certainty whether a cure has actually occurred in a particular patient. The results of these cases treated by intramuscular injections of kurchi alkaloids are shown in Table I. This table shows the results of the cases treated by intramuscular injections of kurchi alkaloids.

emetine bismuthous iodide. The following is a brief history of such a case. Female, age 7, Jewess. Vegetative *Entamœba histolytica* found on admission. Treatment commenced on the 14th December, 1928. Five injections of half grain of total alkaloids were given intramuscularly. The day after a fairly heavy infection of *E. histolytica* was found on microscopical examination. Two more doses were given on the 20th and 21st December, 1928. On the latter date *B. dysenterica* (Flexner) was isolated, and on the 30th December, 1928, *E. histolytica* were again found. Three more half-grain doses were injected and on the 6th January, 1929, *E. histolytica* cysts were still seen. A course of *B. flexner* vaccine was commenced on the 4th January, 1929 and completed on the 8th February, 1929, eight vaccine injections in all being given to the patient. On the 9th *E. histolytica* cysts were again found, and on the 11th February, 1929 a further course of six half-grain doses were given until the 16th February, 1929. The stools were examined on four consecutive days and no protozoal parasites were found. The mother insisted on taking her daughter out of hospital on the 21st January, 1929.

The combined treatment with vaccines and emetine bismuthous iodide in chronic cases of amœbic dysentery.

The type of case that is sent to the School is rarely an acute one that readily responds to emetine, but generally are those who have resisted all varieties of emetine treatment, in combination

TABLE I.

No.	Age.	Sex.	Race.	Laboratory findings before treatment.	Total alkaloids given in grain doses intramuscularly.	Laboratory findings after treatment.	Results.
1	40	M.	H.	*E. histolytica* vegetative	6 + 3 one-grain doses	3 negative examinations.	Probable cure.
2	34	M.	H.	*E. histolytica* vegetative and cysts.	6 + 3 one-grain doses	"	" "
3	40	M.	H.	*E. histolytica* ..	6 + 3 one-grain doses	4 negative examinations.	" "
4	37	M.	H.	*E. histolytica* cysts ..	6 + 2 one-grain doses	3 negative examinations.	" "
5	17	M.	I. C.	*E. histolytica* cysts ..	9 consecutive doses	4 negative examinations.	" "
6	4	M.	I. C.	*E. histolytica* vegetative	6 + 3 half-grain doses	"	" "
7	25	M.	H.	*E. histolytica* vegetative	9 consecutive doses	Several negative examinations.	Cured.
8	24	F.	A. I.	*E. histolytica* vegetative	9 consecutive doses	5 negative examinations.	Probable cure.
9	4	M.	I.	*E. histolytica* ..	6 + 3 half-grain doses	4 negative examinations.	" "
10	7	F.	E.	*E. histolytica* and *B. flexner.*	5 + 2 to 3 half-grain doses.	*E. histolytica* cysts found.	Failure.

In this series of ten cases, there was one case of failure in treatment, viz. No. 10. At this stage, we began to work together. Acton had found that in these mixed cases of infection, it was better to treat the bacillary element first with vaccines for three weeks and then follow with

with stovarsol, yatren, rivanol, etc. These cases corresponded closely to those patients whom the general practitioner recommends to go for a change of climate as a last resort, for the mutual benefit of himself and his patient. Most of these cases were placed under the care of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

senior author as a final test, before deciding whether these patients should take permanent or temporary leave from the tropics. For the first five years there were many failures in spite of administering large doses of alkalies by the mouth, intravenous injections of emetine, etc. After considerable experience with plating such stools on McConkey's neutral red agar and later on a glucose Conradi Drigalski medium, one could almost diagnose an entamœbic infection of the gut by the numerous fine streptococcal colonies on these plates. One then gradually realised that these organisms must play a very great part in increasing not only the acidity of the tissues but also of the gut content in such cases, thereby hindering the lethal action of emetine on these protozoa. The obvious thing to do was to treat the patient first with a vaccine to reduce the bacterial infection of the ulcers, and then administer emetine. How successful the combined treatment of vaccines and emetine bismuthous iodide is, is summarised in Table II. It shows the value of the combined vaccine and emetine bismuthous iodide treatment in cases that had repeatedly failed to be cured by emetine, etc.

however certain one may be about a cure, as it involves the necessity of a competent bacteriologist as well as a laboratory sufficiently equipped to carry out these tests. In this country the two rarely coincide, except in Presidency towns. As the toxicity of the total alkaloids of kurchi bark is low for animals, it would be possible to give much larger doses of them than of emetine to increase the concentration of these alkaloids in the gut, and so overcome the acidity present in the large intestine without having to resort to vaccine treatment. We therefore decided to try the effect of kurchi bismuthous iodide only in the treatment of these cases. Table III shows the value of kurchi bismuthous iodide in the treatment of amœbic infections of the gut.

The results show that out of 18 cases in which doses of 4 grains twice daily were given by the mouth there have been six failures. This result is far better than that of Knowles (1928) who gives the cure rate for a 10 days' course of emetine bismuthous iodide to be about one out of every two cases. In cases Nos. 13 and 15, who were not cured by 8 grains a day, we repeated the 10 days' course, giving 20 grains a day in two

TABLE II.

No.	Age.	Sex.	Race.	History.	Laboratory findings before treatment.	Course of vaccine.	Emetine bismuthous iodide in grains.	Laboratory findings after treatment.	Results.
1	33	M.	H.	Several courses of emetine, 1926 and 1927.	*E. histolytica* vegetative and streptococci.	Streptococcal.	Grs. 2 for 10 days	Negative after 10 months.	Cured.
2	51	M.	H.	Several course of emetine.	*E. histolytica* cysts and streptococci.	"	Grs. 2 for 10 days	Negative after several examinations.	"
3	47	M.	E.	Chronic dysentery for 4 months.	*E. histolytica* cysts *B. flexner.*	*B. flexner*	Grs. 2 for 10 days	"	"
4	50	F.	A. I.	Emetine failed 3 months ago.	*E. histolytica* cysts *Staphylococcus mollis.*	*Staphylococcus mollis.*	Grs. 2 for 10 days	Negative after 3 examinations.	
5	28	M.	H.	Dysentery, 1920 and 1927.	*E. histolytica* cysts *B. flexner.*	*B. flexner*	Grs. 2 for 10 days	Negative and seen after.	"
6	28	M.	A. I.	Chronic with hepatitis.	*E. histolytica* cysts *B. pseudo-carolinus.*	*B. pseudo-carolinus.*	Emetine 1 gr. for 3 days, 2 grs. for 7 days.	Negative after 4 examinations.	
7	38	M.	A. I.	Several failures.	*E. histolytica* vegetative streptococci.	Streptococcal.	Grs. 2 for 10 days	Negative for several weeks.	"
8	45	M.	E.	Repeated failure of emetine.	*E. histolytica* cysts streptococci.	"	Grs. 2 for 10 days	Negative after 4 examinations.	Stated he was cured. An M. O.
9	42	M.	E.				Grs. 2 for 10 days	Not examined	"
10	35	M.	E.	"	"	"	Grs. 2 for 10 days	Negative after 4 examinations.	No trouble for 3 years.
				"	"	"			

These cases are selected by reason of the fact that they had all undergone repeated courses of emetine treatment under medical men, but had failed to be cured by them. Such cases are comparatively rare and therefore we can only quote ten of them. The main cause of acidity in the gut seems to be streptococcal infection of these ulcers, then the *B. dysenteriæ* (Flexner) and occasionally other organisms. For India this method of combined treatment is not practical,

divided doses, and one of them has been cured by the larger dose.

Discussion.

We have shown that in acute cases the total kurchi alkaloids are as powerful as emetine in their immediate effect on the symptoms as well as their curative value, even in one-grain doses. Except for the production of slight hyperæmia and congestion at the site of inoculation, there

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE III.

No.	Age.	Sex.	Race.	History.	Laboratory findings before treatment.	Kurchi bismuthous iodide orally in grains.	Laboratory findings after treatment.	Results.
1	6	F.	E.	Chronic enteritis.	*E. histolytica* cysts *B. shiga.*	Grs. ii b.d. for 10 days	Negative for several weeks.	Cured.
2	38	M.	H.	Leucoderma, carrier.	*E. histolytica* cysts	Grs. iv b.d. for 10 days	"	"
3	48	M.	E.	Subacute	*E. histolytica* and Enterococci.	Grs. iii b.d. for 10 days	Negative for 4 examinations; + at 5th examination.	Failure.
4	22	M.	H.	"	*E. histolytica*	Grs. iv b.d. for 10 days	Negative for 6 examinations.	Cured.
5	29	M.	A. I.	Chronic	*E. histolytica* *B. enteritidis.*	Grs. iv b.d. for 10 days	"	"
6	32	M.	A. I.	"	*E. histolytica*	Grs. iv b.d. for 10 days	"	"
7	46	M.	A. I.	Chronic 20 years.	"	Grs. iv b.d. for 10 days	Negative for 8 examinations.	"
8	48	M.	E.	Chronic	*E. histolytica* cysts and vegetative.	Grs. iv b.d. for 10 days	Positive.	Failure.
9	38	M.	H.	Chronic 2 years.	*E. histolytica*	Grs. iv b.d. for 10 days	Negative after treatment.	General condition improved.
10	47	F.	H.	Low fever.	*E. histolytica* and *B. fæcalis alkaligenes.*	Grs. iv b.d. for 10 days	Negative for 3 examinations.	Cured.
11	28	M.	H.	Acute	*E. histolytica*	Grs. iv b.d. for 10 days	Positive	Failure.
12	53	M.	H.	Subacute	*E. histolytica* and vegetative.	Grs. iv b.d. for 10 days	Negative for 6 examinations.	Cured.
13	60	M.	H.	Chronic 5 months.	*E. histolytica* and streptococci.	Grs. iv b.d. for 10 days	Positive	Failure.
14	60	M.	H.	"	pH stool 5.2	Grs. x b.d. for 10 days	Negative for 5 examinations.	Same case as 13, cured.
15	49	M.	A. I.	Chronic 4 years.	*E. histolytica*	Grs. iv b.d. for 10 days	Positive	Failure.
16	49	M.	A. I.	"	"	Grs. x b.d. for 10 days	"	Same as 15, failure.
17	31	M.	E.	Chronic 4 months.	*E. histolytica* *B. flexner.*	Grs. iv b.d. for 10 days	Negative for several weeks.	Cured.
18	45	M.	E.	Asthma, carrier.	*E. histolytica*	Grs. iv b.d. for 10 days	Negative for 4 examinations.	Cured.
19	43	M.	E.	Chronic 10 years.	*E. histolytica* *B. flexner.*	Grs. iv b.d. for 10 days	Positive on 4th day.	Failure.
20	53	M.	E.	Low fever	*E. histolytica, B. pseudo-carolinus.*	Grs. iv b.d. for 10 days	Negative for 6 examinations.	Cured. Liver reduced in size.

is no local hæmorrhage or marked swelling, as is seen with emetine. No toxic effects of any kind were observed when larger doses, viz. two grains, were injected intramuscularly. There is no doubt that the intramuscular route is the method of choice when treating acute cases of amœbic dysentery. The cause of failure in treatment both with emetine and the kurchi alkaloids is due to a secondary bacterial infection of these ulcers by streptococci, *B. dysenteriæ* (Flexner), etc. These organisms form a large amount of acid from the carbohydrates, these diffuse into the tissues from the gut and also into the gut contents. These alkaloids are ten times more powerful when acting in a substrate at a pH of 8 than when acting in one at a pH of 6. There are three methods that are possible to overcome this acidity and so as to allow these alkaloids to work in an alkaline substrate. The first method, and one that seems the most obvious, i.e. to administer large doses of alkalies by the mouth, e.g., ʒi to ʒii of bismuth carbonate every 2 to 4 hours, sodium bicarbonate, citrate, etc., but these drugs have very little effect in reducing the acidity in the large gut. We have found this method useless clinically. The second method is to deal with the organisms that are responsible for the production of this acidity by isolating them, preparing a vaccine, and then immunising these patients against their own organisms. In this way we have been able to alter the pH of the stool from 6.8 to that of a pH 7.35 after three weeks of immunisation. The method is a sound one, as the results in Table II show, as one can assure a patient that even in spite of repeated failures with emetine he will be cured by the combined treatment of vaccines and emetine. Unfortunately, this method is not a very practical one and needs at least six weeks to effect a cure. The third method is to give the drug in large doses in order to attain a sufficiently high concentration for it to be able to be effective in an

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

acid substrate. Fortunately, the total alkaloids of kurchi bark are not in any way toxic, so that large doses can be given, and we can also form an insoluble bismuthous iodide compound, which will not begin to act until it reaches the acid substrate in the cæcum and large intestine. This actually does occur, as qualitatively we find the kurchi alkaloids in the urine of patients taking the bismuthous iodide compound. Now the *Entamœba histolytica* may be living in the tissues or in the lumen of the gut. In the former case it will be in contact with the serum and body fluids at a pH of 7.2, whilst in the gut the contents may reach a high degree of acidity between a pH of 5 and 6.

Dobell and Laidlaw in 1926 found that emetine acted in a concentration of 1 : 50,000 when tested on cultures of *Entamœba histolytica;* they did not give the pH of their cultures but merely stated that they were constant. Chopra and others (1927) found when using flakes of mucus from an infected kitten, that conessine killed these amœbæ in a dilution of 1 : 280,000 and emetine in a dilution of 1 : 200,000. In an acid substrate of a pH of 6 these figures would probably be reduced down to 1 : 28,000 and 1 : 20,000. When administering 10 grains of kurchi bismuthous iodide, we would really be only giving 3.3 grains of the total alkaloids that would come into the cæcum and ascending colon of a capacity of 4 litres where a concentration of 1 : 18,000 would be attained. Therefore a 10-grain dose will be more effective than a 4-grain dose when dealing with these amœbæ living in the lumen of the gut where the contents are acid. The amœbæ inside the bowel wall will not be affected unless the drug is absorbed and then excreted into the large gut. We are still in the experimental stage as regards dosage and this paper is only a preliminary note. Whether the combined treatment by injections with oral administration of these alkaloids is the best method still remains to be proved by us.

Our experience in the use of the total alkaloids of kurchi bark in the treatment of acute and chronic amœbic infections of the bowel justifies us in arriving at the following conclusions:—

CONCLUSIONS.

(1) In the laboratory, and to a greater extent clinically, the total alkaloids of kurchi bark are far superior to emetine.

(2) The kurchi alkaloids can be given in large doses, and so far no depressant, emetic, or irritative effects have been observed by us. They are much less toxic than emetine.

(3) Intramuscular injections of 2 grains of the total alkaloids cause transient hyperæmia and œdema; this is not visible to the eye unless the dose is injected subcutaneously, and the swelling passes off in 24 to 48 hours. Injections should be used for acute cases of amœbic dysentery.

(4) The kurchi bismuthous iodide can be given orally in 10-grain doses twice a day for 10 days without any deleterious effects.

(5) In chronic amœbic colitis, 4 grains of kurchi bismuthous iodide given orally twice a day for ten days cured 12 out of 18 cases, compared with one out of every two with emetine bismuthous iodide.

(6) Intramuscular and oral administration of the total alkaloids of kurchi bark cure non-suppurative hepatitis; their action on suppurative amœbic hepatitis has still to be investigated.

(7) The administration of the total alkaloids of kurchi bark, instead of conessine only, means a larger yield of the drug, and therefore cheapness in production.

(8) As *Holarrhena antidysenterica* grows in the submontane areas all over India from the Himalayas to Travancore, it is easily procurable in this country.

The total alkaloids for injection and the kurchi bismuthous iodide can be obtained from Messrs. Smith Stanistreet & Co., Ltd., Dalhousie Square, from the Bengal Chemical and Pharmaceutical Co. and also from The Union Drug Co., Calcutta.

REFERENCES.

Acton, H. W. (1921). "On the behaviour of *Paramœcium caudatum* towards Cinchona Alkaloids." *Ind. Journ. Med. Res.*, Vol. IX, p. 339.

Brown, H. C. (1922). "Observations on the Amœbicidal action of Conessine." *Brit. Med. Journ.*, Vol. I, June 24th, p. 993.

Burns, J. H. (1914). "Action of Conessine and Holarrhenine, the alkaloids of *Holarrhena congolensis* and also oxy-conessine." *Journ. Phar. and Exper. Therap.*, Vol. VI, p. 305.

Chopra, R. N., Gupta, J. C., David, J. C. and Ghosh, S. (1927). "Observations on the Pharmacological Action of Conessine, the alkaloids of *Holarrhena antidysenterica.*" *Ind. Med. Gaz.*, Vol. LXII, p. 132.

Dale, H. H. and Dobell, C. (1917). "Experiments on the Therapeutics of Amœbic Dysentery." *Journ. Pharm. and Exp. Therap.*, Vol. X, p. 399.

Datta, R. C. and Ghosh, R. D. (1881). "Kurchicine in Amœbic Dysentery." *Ind. Med. Gaz.*, Vol. XVI, p. 74.

Dobell, C. and Laidlaw (1926). "The Action of Ipecacuanha alkaloids on *E. histolytica* and some other Entozoic Amœbæ in culture." *Parasitology*, Vol. XVIII, No. 2, p. 206.

Ghosh, S. and Ghosh, N. N. (1928). "The Alkaloids of Kurchi bark. Part I—A Preliminary note on two new alkaloids discovered in Indian Holarrhena." *Journ. Ind. Chem. Soc.*, Vol. V, No. 4, p. 477.

Haines (1858). *Trans. Med. and Phys. Soc., Bombay.* New series IV. Appendix of Proceedings, p. xxviii. Meeting of 2nd October.

Haines (1865). "Notes on Conessine *alias* Wrightine." *Pharm. Journ.*, Vol. VI, p. 432.

Henry, T. A. and Brown, H. C. (1928). "An Indian Remedy against Dysentery." *Lancet*, Jan. 14, p. 108.

Knowles, R., Napier, L. E., and Das Gupta, B. M. (1923). "A Preliminary Note on the Relationship of the Intestinal Protozoa of Man to the Hydrogen-ion Concentration of their environment." *Ind. Med. Gaz.*, p. 151.

Knowles, R. and others (1928). "Treatment of Intestinal Amœbiasis. (Analysis of results and review of literature.)" *Ind. Med. Gaz.*, Vol. LXIII, p. 455.

Kanai Lall Dey (1896). *Indigenous Drugs of India.* "Holarrhena antidysenterica," p. 154. Thacker, Spink & Co.

Kanga, Ayyar and Simonsen (1926). "Conessine." *Journ. Chem. Soc.*, Vol. CXXIX, p. 2123.

Pyman (1919). "Alkaloids of *Holarrhena congolensis*, Stapf." *Journ. Chem. Soc.*, Vol. CXV, p. 163.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

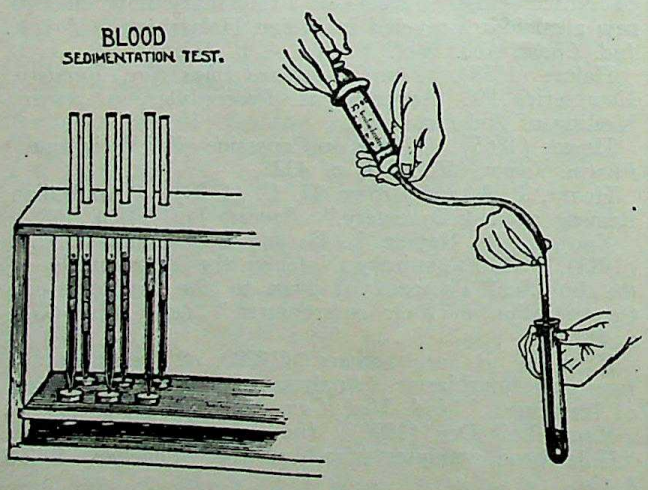
Digitized by Arya Samaj Foundation Chennai and eGangotri

THE ERYTHROCYTE SEDIMENTATION TEST IN LEPROSY.

By E. MUIR, M.B., Ch.B., M.D., F.R.C.S., Ed.,
Leprosy Research Worker, Calcutta School of Tropical Medicine and Hygiene.

EXPERIENCE has shown that the rate of sedimentation of the red blood corpuscles varies in the different types, stages and phases of leprosy and that the use of the sedimentation test in leprosy provides a valuable guide in treatment, as well as giving information of diagnostic and prognostic value. The classification of leprosy used below is that adopted by the Leprosy Research Department of the Calcutta School of Tropical Medicine & Hygiene.*

The technique advised is an adaptation of that used by other workers and is chosen because it makes it possible to test a large number of bloods at once with fair accuracy and with the expenditure of a minimum of time. 0.3 c.c. of a 5 per cent. solution of sodium citrate in distilled water is drawn into an all-glass 2 c.c. syringe; 1.2 c.c. of blood is drawn from the patient's vein into the same syringe, and a small quantity of air having been taken into the syringe barrel, the blood and citrate solution are thoroughly mixed by reversing the syringe several times, and the mixture is evacuated into a clean test tube. If several patients are to be tested, their bloods are taken in a similar manner and placed in labelled test tubes in a rack. Sedimentation is carried out in 300 mm. pipettes graduated from above downwards from zero to 100, there being a space of 3 mm. between each mark. The content of the pipettes when filled up to zero is approximately 1 c.c., but a variation of 0.05 c.c. is allowed as such a variation makes no appreciable difference in the results. The pipettes are placed upright in a rack, with their points inserted in small holes bored in rubber corks (as in the illustration).



One of these pipettes is taken from the rack and its upper end is attached to a 10 c.c. syringe by means of a rubber tube. The point of the pipette is inserted in one of the test tubes and, suction being applied by pulling on the piston of the syringe, the blood-citrate mixture is drawn up into the pipette to the zero mark. The pipette is then replaced in the rack, the point again being inserted in the rubber cork which prevents the mixture escaping, and the rubber tube is then disconnected from the pipette. In this way the other pipettes are filled up to the zero mark from the other test tubes.

The top level of the erythrocytes is read off after 1½ hours and again after 2½ hours and the average of these two readings is taken as the sedimentation index (hereafter called "S. I."). Thus if the level of the top of the blood cells falls to 10 (30 mm.) after 1½ hours and to 20 (60 mm.) after 2½ hours, the S. I. will be the average of 10 and 20, i.e. 15. The maximum reading is about 80 (240 mm.). Generally speaking the S. I. in the different stages of leprosy increases in direct proportion to the number of bacilli in the body. In the early (A 1) stage, it is practically the same as in uninfected persons, i.e. between 10 and 20. In B 1 cases it may be slightly increased; in B 2 cases it is 30 to 40; and in B 3 cases 40 to 60.

The S. I. is also a criterion of the reaction phase in direct proportion to the degree and extent of the reaction. Thus the sedimentation index in a B 2 case may increase from 30 to 60 or 70 during a reaction, returning to the former level as the reaction passes off.

The S. I. is also a criterion of the reaction level. Thus a non-reacting patient, who shows for a considerable time more rapid sedimentation (high S. I.) than would be expected from the clinical stage of the disease, will react to a smaller dose of potassium iodide or any other reaction-producing drug than a patient with a comparatively low S. I. The more easily reaction is produced, the lower is the reaction level. This is important in the regulation of treatment, which can be pressed when there is a comparatively low S. I. (and therefore high reaction level), but must be proceeded with carefully when the S. I. is high, and the reaction level low; otherwise a severe reaction may be produced which will lower still further the resistance of the patient and cause an increase of the disease.

It must be remembered, however, that the sedimentation test is not in any sense specific in leprosy. A rise of the S. I. is caused by malaria, syphilis, septic processes, and in fact by everything which causes unusually rapid metabolism or breaking down of the tissues of the body and consequent absorption of waste materials. This must always be kept in mind in interpreting the S. I. These diseases and other causes also lower the

* *Leprosy, Diagnosis, Treatment and Prevention,* British Empire Leprosy Relief Association (Indian Council), Delhi.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

patient's reaction level and lower his resistance to leprosy. In treating such cases special leprosy treatment must be delayed or given only in small doses, while predisposing and complicating diseases, etc., must be sought for and remedied. When this is accomplished the S. I. may be expected to fall, whereupon the special treatment may be pressed with safety.

The effect of a given dose of medicine (such as potassium iodide given orally, or injections of hydnocarpus preparations) upon the sedimentation rate, serves to indicate whether the next dose should be increased or diminished and after what interval it should be given. If the S. I. is low or only moderately high considering the type of case, and if there is no change produced in the rate of sedimentation by the given dose, there is a clear indication that the treatment may be pressed. If, on the other hand, there is a marked rise in the sedimentation index following the dose, the next dose should be delayed till the former level is reached and the dosage should not be increased but should possibly be lowered.

If the S. I. is high or shows further signs of rising, then special treatment (hydnocarpus, potassium iodide, etc.), must be stopped and drugs which have an anti-reaction effect should be used. One of the most valuable of these is potassium antimony tartrate given intravenously in 0.02 gramme doses every second day; alkalies given orally or intravenously are also useful for this purpose.

The gradual lowering of the S. I. which takes place under treatment is of considerable prognostic value as an indication that the disease is gradually being eliminated from the body.

An unusually low S. I. (3 to 8) which sometimes occurs even in B 2 cases, may generally be counted as a good sign. Such patients, as a rule, improve rapidly under treatment.

When a former B 2 or B 3 case has become bacteriologically negative, and if he can stand large doses of potassium iodide (up to 240 grains) without an increase in S. I., it is a good prognostic sign.

The sedimentation test is useful in testing the efficiency of any drug in the treatment of leprosy. If the remedy does not possess the power of raising the S. I., it is not likely to be effective in eliminating the leprous infection from the body. There are however certain very useful reaction-reducing drugs, the effect of which is to lower the S. I., such as those mentioned above.

A NOTE ON CHOLERA IN INFANTS.

By J. DAS GUPTA, M.B., D.P.H.,
Demonstrator of Pathology, Carmichael Medical College, Calcutta, and Visiting Physician, the "Babies Home," Calcutta.

CHOLERA is seldom seen in infants, but during this past epidemic in Calcutta, I had a number of cases in the fourth week of May and the first week of June while attending the infants at the "Babies Home." The first two cases ended fatally within a few hours of the attack and I could not diagnose the condition on account of the very peculiar symptoms which each of these babies presented and which I shall relate later. These cases were also seen by other physicians whom I called to my help. When the third case came, my suspicion arose about cholera, though the symptoms were abnormal, but there were a large number of cases in the immediate neighbourhood. It was only when I took a sample of stool from the third case, cultured it and performed the agglutination test with high titre cholera serum that I came to a definite diagnosis. Four other cases occurred after this in quick succession, and in each of these, excepting one, the stools were cultured and agglutination tests were performed and found to be positive. Fever was present in all these cases excepting one. The ages of these babies ranged from 3 months to 1½ years. As regards the source of infection, I tried to find it out, but there were so many difficulties in the way that I had to give up the idea; but when the nursing staff was entirely changed and the new staff and all the babies were inoculated with cholera vaccine and the utmost hygienic precautions were taken, the epidemic stopped without any further fresh cases. That the first two cases passed undiagnosed but to me appeared as cases of cholera will be evident from the following reports:—

Case No. 1.—Baby Sushila, aged 4 months. Passed the first stool in the morning on 29th May, 1929, white, curdy in character; reaction acid when I saw the stool; no urination after the first stool. The child had another similar characteristic stool at 4 p.m. and after this it began to sink very rapidly; tympanites set in; the pulse became very weak; at about 9-30 a.m. the child began to show a peculiar continuous twitching of the face and legs, the knee jerks were exaggerated. The baby had received no injury. On 30th May, 1929, the baby had no stool, but the condition remained the same. Bromides and chloral completely failed to check the convulsions. The pulse was almost imperceptible. In the evening the temperature rose to 108°F., but it came down to 97°F. in two hours after cold sponging. The baby died the same evening. A provisional diagnosis of gastric tetany was given in the death certificate.

Case No. 2.—A Belgachia baby one year old; it was a healthy baby the previous night, i.e., on 30th May, 1929, and so no special notice was taken of it. On the morning of 31st May, 1929, the baby presented a quite changed appearance, eyes sunken, pulse very bad, toxæmic, with excessive tympanites; according to the nurse the baby had had two stools in the previous night and these were curdy white in appearance. Twitching of the face and legs set in the early hours of the morning; urination was absent after the first night stool until death. Rectal saline, atropine, adrenalin and a rectal wash were given, but the baby became uræmic so rapidly and collapsed that I had no time to give subcutaneous saline. The baby died the same morning.

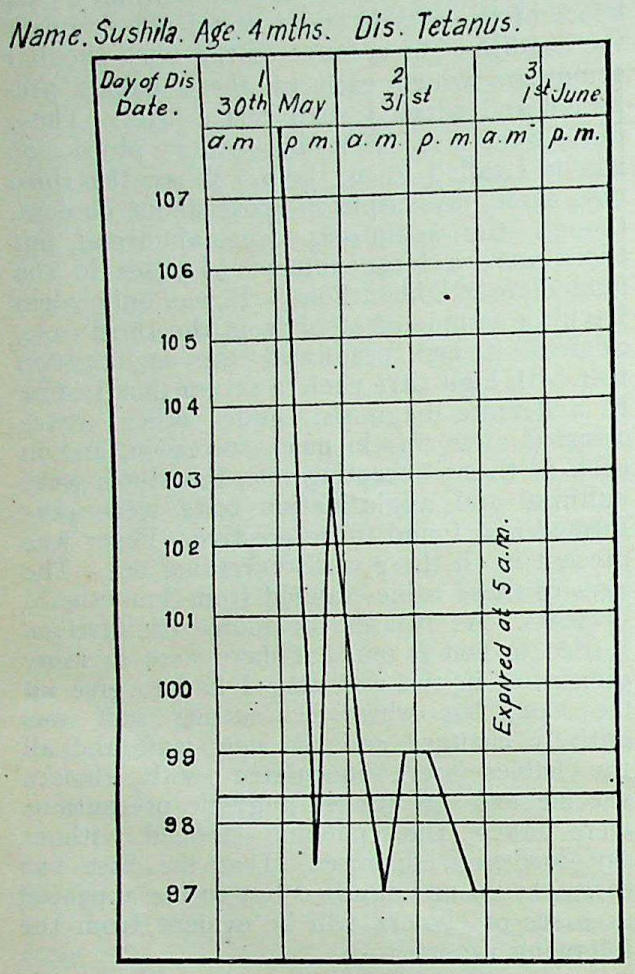
These two cases aroused my suspicion that either they might be cases of food (milk) poisoning or cholera. I stopped the existing supply of milk and the utmost precaution was taken in feeding the babies. Still a third case developed.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Case No. 3.—Bibha, an older baby, 1½ years old. This baby showed the first symptoms in the early hours of the morning of 30th May, 1929, when it passed the

CASE No. 1.



first stool which was white, watery, and slightly mucoid, attended with vomiting. It passed several stools, and vomited several times and a condition of collapse set in with rigidity of the extremities very rapidly. I took one of the stools for examination and sent the baby to the Carmichael Medical College Hospital, where it was clinically diagnosed as cholera and my bacteriological examination confirmed the diagnosis. The baby survived after the usual saline treatment.

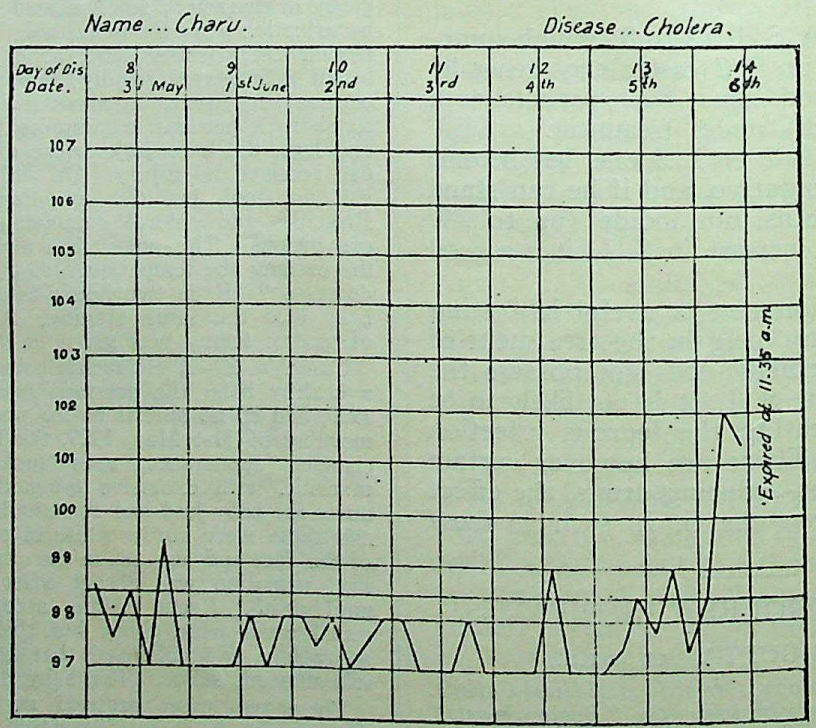
Case No. 4.—Charu, aged 4 months, lived with her mother: on 5th June, 1929, she had one loose yellow stool at 5-30 in the evening. Within an hour the pulse became almost imperceptible, the eyes sunken, and this was followed rapidly by tympanites and anuria. The usual saline treatment with atropine and adrenalin was given, but so rapidly did uræmia set in that the child died the next morning. It had no further stool and no stool was examined in this case. The baby had fever during the attack. Its mother was attacked with a clinical type of cholera the very next day after the death of the baby. She was sent to the Carmichael Medical College Hospital, where the case was diagnosed as cholera clinically and bacteriologically, and she died of it.

Evidently the mother got the infection somehow and transmitted the same to her baby, who succumbed earlier than her mother.

Case No. 5.—Baby H., aged about 3 months; this baby was attacked on 5th June, 1929, at about 4 p.m. The first stool was like that of the first two cases, white and curdy in character. The second stool followed after two hours and was more liquid. Anuria followed but there was no vomiting. Twitching of the extremeties set in. Encouraged by the previous results, I took a sample of the stool and at once went to the laboratory for bacteriological examination and culture, which was found to be positive for cholera. Subcutaneous salines, rectal washes, atropine, adrenalin were given and the baby survived. This baby had fever during the attack.

Case No. 6.—Bella, 1½ years old, was attacked on the night of 30th May, 1929. The first stool was watery with white specks in it and the number of stools was rather frequent. Anuria was present. After the second stool the child collapsed very rapidly and so subcutaneous saline, atropine and adrenalin were given. In the morning the stool was taken by me for examination and the cholera vibrio was found on culture. The baby survived.

CASE No. 4.



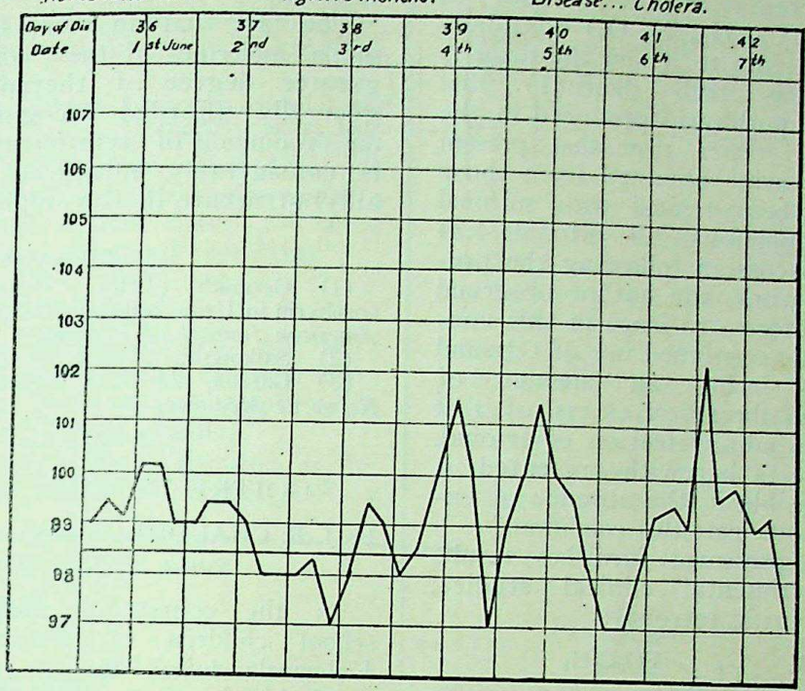
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

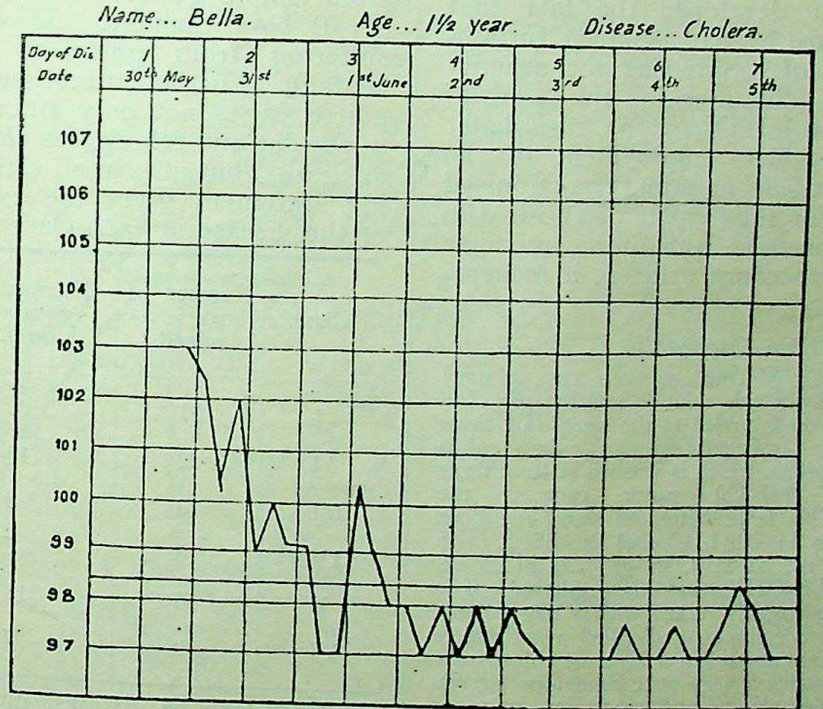
So it is evident that the characteristic rice water stool and vomiting are usually absent in cholera in infants. The number of stools is generally restricted to two or three, and in some cases to one only. Anuria, the rapid onset of uræmic symptoms, and collapse and white curdy stools are the most characteristic features noted by me in infants in this epidemic.

I am much indebted to Miss M. Kotval, Lady Superintendent of the "Babies Home," for giving me the earliest possible information about these cases and for keeping complete records of them.

CASE No. 5.



CASE No. 6.



THE EFFECT OF TETRONAL ON THE PRODUCTION OF HÆMATOPORPHYRIN IN THE URINE.

By FREDERICK G. GERMUTH,

Division of Research, Bureau of Standards, Baltimore, Maryland, U. S. A.

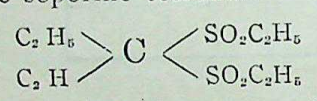
THE author has endeavoured to show in a previous research(1) concerning the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

employment of the sulphones (sulphonal and trional) in the treatment of certain mental diseases, that following an increase in ethyl groups present in the molecule of the compounds constituting this series of hypnotics, there is also a corresponding increase in the amount of hæmatoporphyrin ($C_{34}H_{38}N_4O_6$) contained in the urine of patients to whom the drug is administered. It has been shown(1) that the portion of the porphyrin produced in the trional urines was greater than that present in the samples of urine obtained from those patients who had been treated with sulfonal in the relative proportions: 1.0 sulfonal: 1.34 trional. In the discussion following the presentation of this work, the author observed "it would be of interest to learn in this connection whether the continued use of tetronal is capable of producing an amount of hæmatoporphyrin in theoretical excess of that engendered by the administration of trional. In view of the facts herewith presented, it would appear feasible in the absence of experimental data to anticipate this condition."

The paper here presented furnishes results obtained in experimental clinical studies, employing the soporific tetronal:



Experimentation developed the fact that the method advocated by Salkowski(2) furnished a better means of ascertaining the quantity of the sought-for substance in the samples of urine than that of Garrod(3), the latter method finding wider employment in the determination of traces or minute portions of the porphyrin. For the benefit of those who may not be familiar with the technique involved in the procedure utilized, it is herewith presented:

Method Employed.

A mixture consisting of equal portions (by volume) of saturated barium hydroxide solution and ten per cent. barium chloride solution is added to the sample of urine under examination; precipitation of the solids resulting. The precipitate, which is washed at least three times with warm (37°C.) water, contains the hæmatoporphyrin. This is permitted to stand one hour at room temperature in ethyl alcohol acidified with hydrochloric acid (1 c.c. of HCl, sp. gr. 1.20, in 25 c.c. of 95 per cent. C_2H_5OH), and then filtered. The alcoholic filtrate is thoroughly mixed with a like volume of chloroform, and two volumes of distilled water added. This is carefully shaken, and a lower layer of chloroform is obtained which contains a very pure hæmatoporphyrin, while the upper layer of alcohol and water contains other pigments in addition to a small amount of the compound.

Results.

The patients from whom the samples of urine were obtained had been treated with tetronal for at least three weeks prior to examination, the dosages employed being fairly constant. Meticulous attention was accorded to ten samples, representing the twenty-four hour output of patients to whom the medicine had been given. The observation was made that the general relation existing between the three compounds, sulfonal, trional and tetronal as regards their ability to accelerate the formation of hæmatoporphyrin in urine is in the proportion: 1.00 sulfonal: 1.34 trional: 1.56 tetronal.

The fact that an increase in ethyl groups in the molecules of these compounds imparts a greater degree of therapeutic activity is generally afforded recognition. Apparently, the production of hæmatoporphyrin in the urine is considerably influenced by the molecular alkyl structure of the sulphone ingested.

REFERENCES.

(1) Germuth (1927). "Occurrence of Hæmatoporphyrin in Urine following Administration of Trional." *American Journal of Pharmacy*, 99, November.
(2) Salkowski. *Zeitschr. f. Physiol. Chem.*, 15.
(3) Garrod. *Journ. of Physiol.*, 13 and 17; Salliet, *Revue de Medicine*, 16.

GOITRE IN MULTAN DISTRICT.

By J. R. CHAUDHRI, M.R.C.S., L.R.C.P., D.P.H. (Camb.),
District Medical Officer, Multan.

IN the course of medical inspection of school children of Mulepur, a village in Kabirwala *tahsil*, it was noticed that a remarkably large number of children suffered from simple goitre. Out of a total number of 70 boys examined, 32 were found to be suffering from goitre—a very high percentage. Further investigation showed that goitre exists not only amongst the students of the 1st and 5th classes that were examined medically, but also in all classes. The following statement gives the extent of incidence of the disease in each class:—

Class.	Number of boys examined.	Number of goitrous boys.	Percentage.
I	57	20	35.1 per cent.
II	22	19	86.4 per cent.
III	13	8	61.5 per cent.
IV	8	7	87.5 per cent.
V	16	12	75.0 per cent.
VI	9	7	77.8 per cent.

This state of affairs naturally led me to look for goitre amongst the grown-up people of the village. I found a large number suffering from this disease. In a small village of 400 souls there are about 15 persons with very big necks (Derbyshire necks). These are the persons whom everybody in the village knows by reason of their prominent necks. But there exists a considerably larger number of persons who have goitres of too small a size to be noticed by laymen. As a matter of fact,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

I believe that about 60 per cent. of the population of this village suffers from goitre.

I was told that the disease prevails much more amongst the females than amongst the males. I could not personally verify this fact because one is unable to see a large number of women. They told me, however, that there are more women than men who have got big goitrous necks.

There are in this village 3 persons who have subnormal brains, one of them is feeble-minded and has goitre, the other two are cretins, and one of them definitely suffered from goitre. It is possible that there is some correlation between goitre and cretinism.

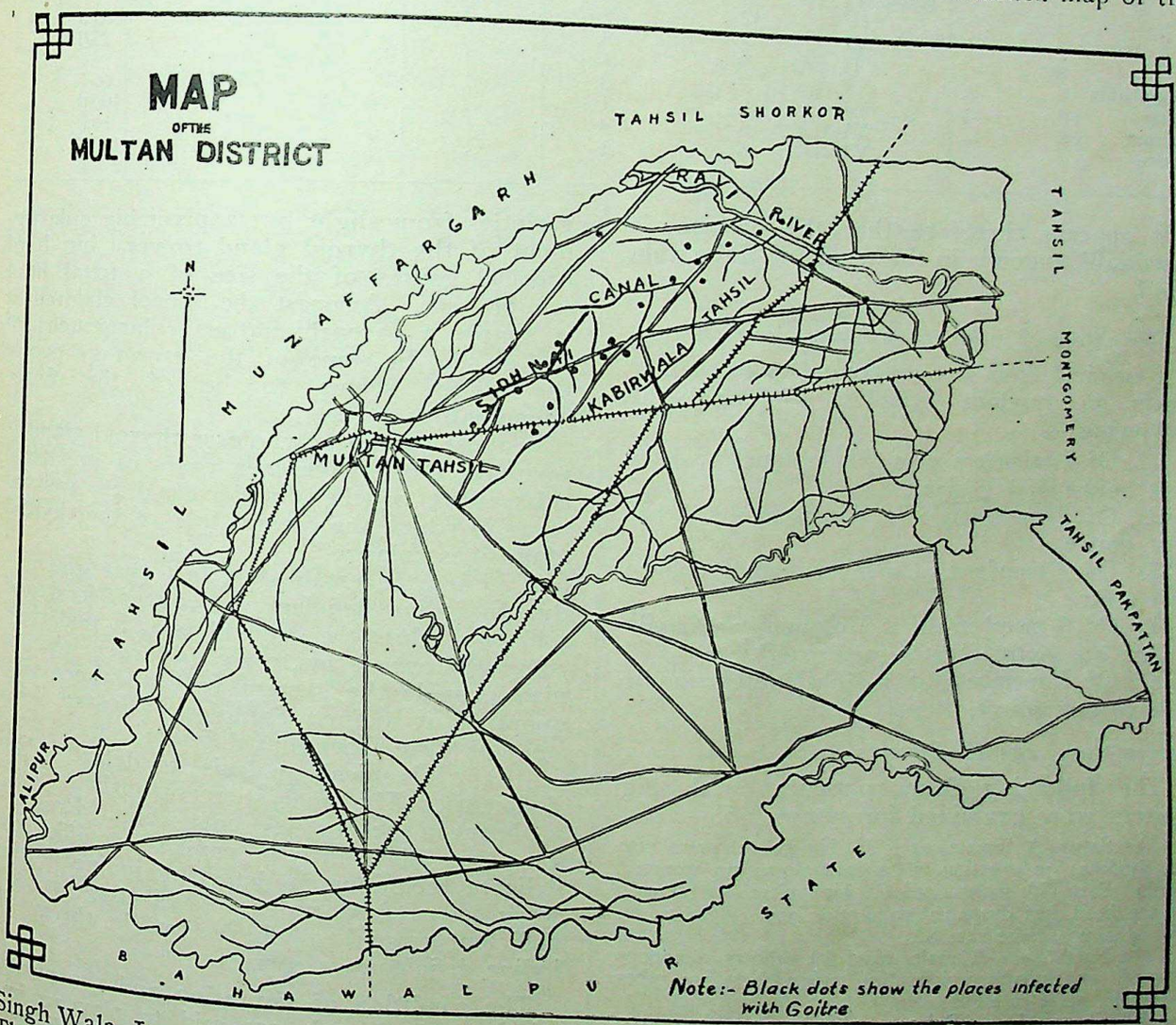
Age Incidence:—

The disease seems to attack all ages except the infants. I examined many infants but none of them showed any appreciable enlargement of the thyroid glands.

I also visited three villages situated in the neighbourhood of Mulepur, namely Bute Singh Wala, Jawandsingh Wala and Kohiwala. The following statement gives the incidence of the disease amongst the school children in these 3 villages.

Class.	Number of boys examined.			Number of goitrous boys.		
	1	2	3	1	2	3
I	8	47	22	4	6	13
II	6	31	8	2	7	5
III	12	16	5	7	4	5
IV	13	12	7	5	2	6
V	..	14	..	..	3	..
VI	..	13	..	..	5	..

It is clear from the above that goitre is endemic in these villages also. Moreover, medical examination of school children at Sardarpur and Sarai Sidhu also revealed the existence of goitre in the villages of Aulak Sidhu, Bagar and Sardarpur. I have also seen cases of goitre in Jaso Kanwan, another village of Kabirwala *tahsil*. The following statement gives the incidence of simple goitre in each village, the situation of these villages is shown in the attached map of this district. It would appear that the disease is highly endemic in the whole of Kabirwala *tahsil*, especially so in the villages situated along and quite close to the Ravi river. I have



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

also seen cases of goitre in some villages of Multan *tahsil*. In Multan city itself the disease is widely prevalent. I also noticed goitrous cases in Taraf Muabarak, a suburb of Multan city. Similarly, I noticed cases of goitre in Tulamba, Khanewal *tahsil*.

Name of Village.	Class.	Number of Boys Examined.		Number of Boys suffering from Goitre.		Percentage of Goitrous Children.	
		Mohammadan.	Hindus.	Mohammadan.	Hindus.	Mohammadan.	Hindus.
Jodhpur	I	10	30	3	6	30 per cent.	20 per cent.
	II	1	14	1	3	100 "	21.4 "
	III	3	21	1	6	33.3 "	28.6 "
	IV	9	9	..	3	..	33.3 "
	V	..	4	..	2	..	50.0 "
Raipur	I	18	10	1	3	5.6 "	30.0 "
Chak Sher Khan ..	I	33	3	12	2	36.4 "	66.7 "
	II	8	1	3	1	37.5 "	100.0 "
	III	2	2	..	1	..	50.0 "
	IV	5	3	..	1	..	33.3 "
	V	3	..	1	..	33.3 "	..
Qadirpur Ran ..	I	28	10	8	2	28.6 "	20.0 "
	II and III	11	3	1	..	9.1 "	..
	IV	12	3	2	1	16.7 "	33.3 "
	VI	9	4	..	1	..	25.0 "
	VII	9	1	1	..	11.1 "	..
Bangalwala ..	VI	7	3	1	2	14.3 "	66.7 "
Bohar	VI	10	1	..	1	..	100.0 "
Hajipur	VI	8	4	6	2	75.0 "	50.0 "
Luthar	VI	6	1	..	1	..	100.0 "

It appears therefore that the disease is essentially endemic in the whole of Kabirwala *tahsil*.

The extent of incidence in families in Kohiwala.

I enquired from five different families, taking them as random samples. I found the following:—

1. Of 7 members of a Hindu family 5 have got goitre of big size.
2. Of 3 members of a Hindu family 1 has got goitre.
3. Of 9 members of a Hindu family 3 have got goitre.
4. Of 6 members of a Mohammadan family 2 have got goitre (brother and sister).
5. Of 7 members of a Mohammadan family 2 have got goitre.

Symptoms and Ill Effects:—

The following four patients with big goitres were examined for symptoms:—

(1) Satu.—A female, aged 35, big goitre, pulse rate 80, dyspnœa on exertion, no exophthalmos, no tremor.

(2) Para.—A male, aged 60, big goitre, has tremor of the head, has dyspnœa, palpitation and giddiness, no exophthalmos, pulse rate 82.

(3) Nand Lal.—A male, aged 10, shows tendency towards exophthalmos, has big goitre but no other symptom, pulse rate 80.

(4) Chanan Das.—Pulse rate 88, has got big goitre, shows tendency towards exophthalmos.

The last two are brothers.

The fact that several members of a family escape from this disease shows that there is more than one factor at work in the causation of the disease, that some are more disposed to this disease than others.

Pathology:—

The size of the goitre varies greatly. All varieties from slight but appreciable enlargement of the thyroid gland to very big hard colloidal goitres of the size of a fœtal head can be seen. Amongst the school children it is simply a parenchymatous enlargement of the gland. In some of the grown-up people the goitre seems to be of the fibro-adenomatous type.

In most cases the whole of thyroid gland is involved, but I have seen cases of unilateral enlargement of the thyroid gland as well as cases in which the central lobe of the thyroid gland was enlarged.

It is now an established fact that goitre is due to iodine deficiency in water, food and soil, and that the thyroid gland undergoes compensatory hypertrophy in order that it may provide the system with the necessary quantity of iodine. Samples of water, food and soil taken from four different villages were sent for chemical analysis to detect iodine deficiency. The analyst reports that iodine is absent in the samples sent to him. Presuming that the analyst employed sufficiently delicate technique in detecting iodine in the specimens of food, water and soil, there is thus sufficient ground to believe that the theory of iodine deficiency is correct.

The condition of sanitation and the purity of the water supply are said to play an important part in the incidence of this disease. There is no doubt that the sanitation of the villages in which I have noticed cases of goitre is exceedingly poor, but other villages in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

which goitre is not endemic are no whit better in the matter of sanitation. The purity of the water supplies in these villages is likewise highly questionable even as it is in other villages of the district. I cannot, therefore, establish any definite relationship between bad sanitation with impure water supply and the incidence of goitre.

Prevention of Goitre:—

As for the prevention of goitre, the following quotation from Rosenau solves the problem of prevention admirably:—

"The essentials of goitre prophylaxis are low cost, palatability, ease of administration, minute dosage, harmlessness and efficiency of the iodine preparation used. The method most favoured at the present time is the use of a chocolate tablet containing 10 milligrammes of iodine in the form of an organic acid. This form of iodine has the advantage of being tasteless, non-hygroscopic and very stable. It is so much more pleasant and practical than sodium iodide that Kimball recommends it. One or two of these tablets, according to the age and requirements, should be given each week during the school year to boys and girls, especially between the ages of eleven and sixteen."

It is proposed to try the administration of iodine both as preventive and curative amongst the school children in Kabirwala *tahsil* to begin with. Later on, I have no doubt the remedy will become very popular, as goitre is so prevalent, and we may well expect the people themselves to resort to this remedy. It may be interesting perhaps to note that most of the goitrous persons showed a considerable anxiety to get cured of this disease not on account of any particular disabling symptom, but because of the serious disfigurement the disease causes.

A LIST OF THE SPECIES OF MOSQUITOES COLLECTED IN THE FRENCH SETTLEMENTS IN INDIA.

By THE LATE DR. E. BOREL, M.D.,
*Chief of the Malaria Research Laboratory, Pasteur Institute of Saigon (Indo-China)**
and
MAJOR V. G. F. LABERNADIE, M.D.,
Chief of the Bacteriological Laboratory of Pondicherry (French India).

WE give below a list of the species of mosquitoes collected in the five French settlements in India.

If not otherwise specified the specimens were taken in private houses.

*We very much regret the recent death of Dr. Borel. His contributions to the study of malaria in French Indo-China were numerous and of great value from the epidemiological point of view.—EDITOR, *I. M. G.*

DISTRICT OF PONDICHERRY (SOUTH ARCOT).

July.

	♂	♀
Pondicherry (Town).		
Culex fatigans	32	30
Oulgaret.		
Culex fatigans	0	2
Pseudomyzomyia vaga	2	0
Oulgaret (near cattle).		
Culex fatigans	22	13
Pseudomyzomyia vaga	1	5
Modéliarpeth.		
Culex vishnui	2	0
Culex tritæniorhynchus	2	9
Culex fatigans	30	23
Culex fuscocephalus	1	7
Neomyzomyia tesselata	0	1
Ariancoupom.		
Culex bitæniorhynchus	0	2
Culex fatigans	1	0
Stegomyia argentea	0	2
Pseudomyzomyia vaga	0	4
Villenour.		
Culex fatigans	17	15

DISTRICT OF KARIKAL (TANJORE).

September.

	♂	♀
Karikal (Town).		
Pseudomyzomyia vaga	1	0
Culex gelidus	30	39
Culex barraudi	5	11
Culex tritæniorhynchus	3	0
Stegomyia argentea	2	1
Culex vishnui	0	1
Grande Aldée.		
Anopheles hyrcanus	0	1
Culex bitæniorhynchus	0	3
Culex gelidus	0	17
Culex barraudi?	2	3
Cotchéry.		
Pseudomyzomyia vaga	0	1
Culex bitæniorhynchus	7	3
id. (near cattle)	4	4
Culex gelidus	0	2
Culex tritæniorhynchus	3	2
Culex fuscocephalus	0	1
Tirnoular.		
Pseudomyzomyia vaga	2	10
id. (near cattle)	2	17
Culex gelidus	3	0
id. (near cattle)	4	2
Culex tritæniorhynchus	0	1
id. (near cattle)	0	1
Culex fuscocephalus	1	0
Nedouncadou.		
Culex gelidus	6	14
id. (near cattle)	0	3
Culex tritæniorhynchus	1	1
Culex fuscocephalus (near cattle)	1	3
Stegomyia argentea (near cattle)	0	1

CHANDERNAGORE (BENGAL).

September.

	♂	♀
Megarhinus splendeus	11	13
Stegomyia albopicta	5	35
	(1 ♂ and 14 ♀ near cattle)	
Armigeres obturbans	0	7
Mansonioides annuliferus	0	1
Culex sinensis	0	1
Culex fatigans	0	2
Lutzia fuscana	0	2

MAHÉ (MALABAR COAST).

August.

Armigeres obturbans	9	13
Culex fatigans	22	31

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

YANAON (ORISSA).

September.

	♂	♀
Pseudomyzomyia vaga ..	0	1
Anopheles barbirostris (near cattle)	0	1
Anopheles hyrcanus (near cattle) (var. *nigerrimus*) ..	0	1
Anopheles hyrcanus (near cattle) (var. *sinensis*) ..	0	2
Culex bitæniorhynchus ..	0	9
Culex gelidus (near cattle) ..	0	8
Culex fatigans	27	19
id. (near cattle) ..	16	34
Mansonioides annuliferus (near cattle)	0	3

RECORDS OF ANOPHELINES FROM THE BENGAL DOOARS.

By BHUPENDRA MOHAN KHAN,

Sub-Assistant Surgeon, Bengal Public Health Department, Writers' Building, Calcutta.

THE anophelines of the Bengal Dooars were first studied by Stephens and Christophers in the year 1902, when they found only three species, viz., *A. minimus*, *A. maculatus* and *A. rossi*. Subsequently, Christophers and Bentley in 1903 reported the following nine species:—

(1) *A. minimus*. (5) *A. fuliginosus*.
(2) *A. maculatus*. (6) *A. leucosphyrus*.
(3) *A. rossi*. (7) *A. sinensis*.
(4) *A. barbirostris*. (8) *A. culicifacies*.
(9) *A. aitkeni*.

Sur and Iyengar, in 1926, recorded in their report of malaria survey of Jalpaiguri Dooars the above-mentioned species in addition to (10) *A. jamesii* and (11) *A. karwari*.

Strickland and Chaudhuri collected all the species previously recorded by Sur and Iyengar and, in addition, found (12) *A. maculipalpis*, (13) *A. kochi*, and (14) *A. vagus*. (*Report on a mosquito malaria survey of the Dooars Tea-gardens.*)

Thus previous records show that the detected species of Anophelines in the Dooars were 14 in number.

The writer, who has been stationed for the last nine years at the Meenglas Tea Estate, as officer-in-charge of the Experimental Anti-Malarial Scheme of the Bengal Public Health Department, has found all the above-mentioned fourteen species on the Meenglas Tea Estate as well as on the adjacent tea estates of Dalingkote, Nedeem and Rungamuttee. In November 1926, he collected four specimens of *A. kochi* from Meenglas, one of which was sent to the Central Malaria Bureau, Kasauli, and another to the Bengal Malaria Research Laboratory. The writer subsequently collected one specimen of *A. jeyporiensis* from Dalingkote Tea Estate in the same year and this is the only record of this species from the Dooars. This specimen was sent to the Malaria Research Laboratory for confirmation. In 1928 he collected some more specimens of the same species from the Baintbarie division of the Nedeem Tea Co.

Thus one more species should be included in the list of Anophelines of Jalpaiguri Dooars, the total number being 15 as far as our present knowledge goes. They are as follows:—

(1) *A. minimus*. (8) *A. culicifacies*.
(2) *A. maculatus*. (9) *A. aitkeni*.
(3) *A. rossi*. (10) *A. jamesi*.
(4) *A. barbirostris*. (11) *A. karwari*.
(5) *A. fuliginosus*. (12) *A. maculipalpis*.
(6) *A. leucosphyrus*. (13) *A. kochi*.
(7) *A. sinensis*. (14) *A. vagus*.
(15) *A. jeyporiensis*.

The writer is grateful to the Director of Public Health, Bengal, for his kind encouragement to publish this note.

A COMPARATIVE STUDY OF THE EFFECT OF CLIMATE AND OF THE SEASONS ON BODY WEIGHT IN PULMONARY TUBERCULOSIS IN DIFFERENT COUNTRIES.*

By DR. M. KESAVA PAI, M.D., C.M. (Mad.),

Director, Tuberculosis Institute, Temple Gardens, Royapettah, Madras.

IN a paper(1) contributed to the Congress of the Far Eastern Association of Tropical Medicine in December 1927, at Calcutta and later in another(2) read before the South Indian Branch of the British Medical Association, it was shown by an analysis of the weight of over 550 cases of pulmonary tuberculosis treated during the five years 1923 to 1927 in the Madras Tuberculosis Hospital, that there was a definite relationship between body weight and the seasons of the year. It was shown that in Madras City there was a steady decrease in the gain of weight during the hot months March to September, and an increase in the gain of weight during the cooler months October to February.

A word of explanation is necessary in connection with the accompanying charts. The fall in the curve during the hot months does not mean there was a fall of actual weight during those months, but merely a fall in the rate of increase of weight. In the normal adult there is a physiological rate of increase of weight consequent on body growth, and pulmonary tuberculosis being a disease of adolescence, i.e., of the age period 15 to 35, it is important to distinguish the variation in weight in the normal individual from that observed in the progress of cases of pulmonary tuberculosis. Consequent on the wasting of the body resulting from tuberculous toxæmia, the increase in weight as a result of treatment under favourable conditions is often phenomenal, increases of 30 per cent. to 50 per cent. in the course of a few months being not seldom observed. What

*Being a paper read at the Medical and Veterinary Section of the Indian Science Congress held at Madras in January, 1929.

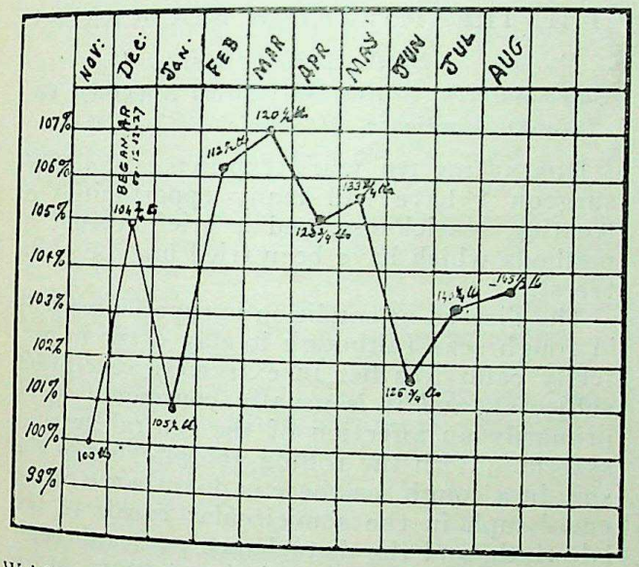
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

we are concerned with in this paper is the rate of increase at different seasons of the year.

It is important in drawing general conclusions that the analysis should be made from a large number of cases and that all possible errors due to accidental causes should be excluded. Thus highly toxic cases rapidly going downhill will interfere with the normal curves, and intercurrent infections like epidemics of influenza, diarrhœa, dysentery, etc., should be taken into due consideration in the calculations. In this paper the increase of weight has been calculated in percentages, and wherever there is a fall in the curve it merely means that the rate of increase has fallen and not the actual weight, unless the curve goes below the 100 line, when it means that the patient has actually lost weight. Thus in Chart I the patient has increased in weight from the beginning to the end, but the curve shows a rise and a fall all the same.

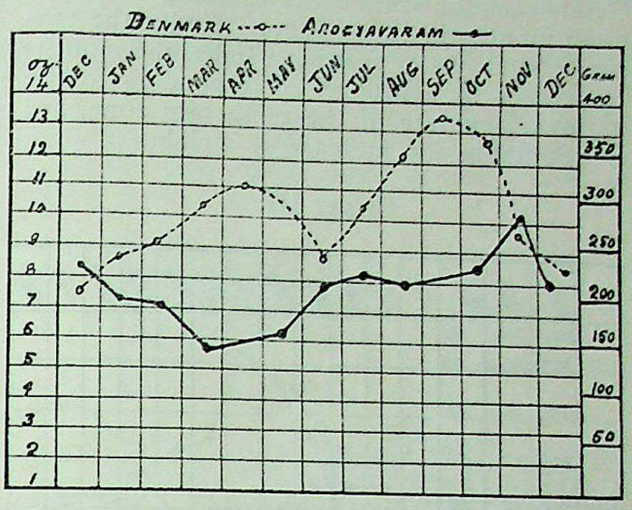
CHART I.



Weight curve of a case where artificial pneumothorax treatment was adopted.

According to Lunde(3) gain in weight in tuberculosis is due to deposition of fat resulting from good feeding and rest and better assimilation of food, and greater retention of water in the system in the cooler and more humid parts of the year. Fall of weight, he considers, can be explained by increased evaporation during the hot months and poorer assimilation and metabolism during the coldest part of the winter and hottest part of the summer. In winter there is also greater combustion and loss of fat to make up for the loss of heat from the body by radiation and increased urination. Lunde has shown that in Norway patients show a slight rise in the weight curve in spring and a higher rise in late summer and autumn when the temperature and humidity are at their optimum with regard to comfort, assimilation and general metabolism. Conversely there is a fall in the curve in midsummer and in winter.

CHART II.



Weight curves of patients in the Sanatoria of Denmark and at Arogyavaram in South India.

Strandgaard's(4) work in Denmark gives similarly consistent results. Strandgaard lays some stress on dietary which he believes has considerable influence on the weight fluctuations, and adds the culinary to the seasonal factors in explaining the variations in weight of patients treated in different sanatoria. He proves by statistics that there is a loss of weight in the majority of Danish sanatoria in July, a gain in September, and a fall again in December. Sunlight, temperature and humidity, according to Strandgaard, combine in influencing body weight.

Frimodt-Möller(5) working at the Arogyavaram Sanatorium in South India produced very interesting figures and curves for the body weight of patients in his sanatorium. In the dry and hot months March to May, he observed patients gained less weight than in the cooler and more humid months June to September, and in the coolest months October to February the gain in weight was greater. These results completely agree with those of Lunde and Strandgaard in Europe, considering that there are no winter conditions in South India and consequently there is no winter dip in the weight curve.

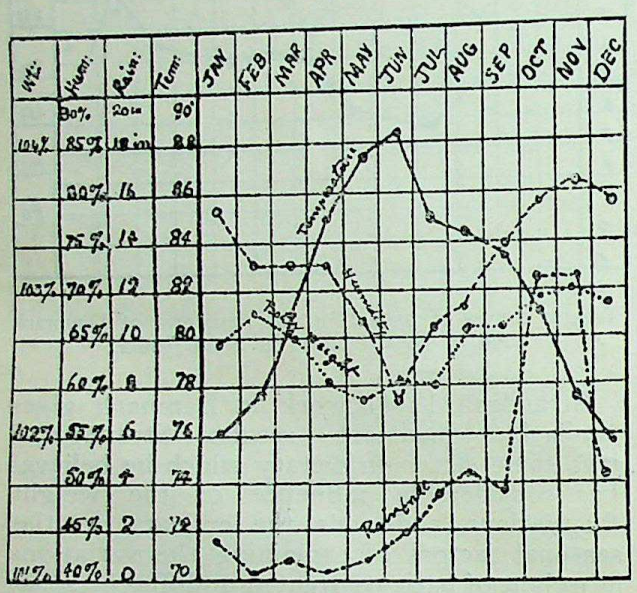
Weight curves and figures for other countries are unfortunately not available in the literature, but it would be very interesting to know what the weight fluctuations are in the humid regions of Western India, in the sanatoria situated on the Himalayan slopes where seasonal conditions are not unlike those of Europe, and in the hospitals and sanatoria of other countries in the world.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Strandgaard, by comparative study of weight figures, pointed out that autumn was the season for maximum increase of weight in all temperate climates, the month of August in Norway, September in Denmark and other countries in Northern Europe, and October in the United States being the optimum months in this respect. Under the tropical conditions of Southern India, the months November to February, corresponding to the autumnal climate of the temperate zone, are the optimum for increase of weight.

CHART III.



Curves showing temperature, humidity, body weight and rainfall—Tuberculosis Hospital, Madras City. Average of the years 1921 to 1927.

Madras with its typically tropical climate has practically a twelve months' summer, of which the four months November to February are comparatively cool and pleasant. Consequently there are only two variations in the weight curve of Madras, the dip of the hotter months March to October, and the rise of the cooler months November to February. The temperature curve runs in an exactly opposite direction to the weight curve. The mean daily temperatures of Madras vary from 74°F. to 80°F. during the cooler months and 80°F. to 90°F. during the hotter months, the former being practically the summer temperature of Europe. The fluctuations in the weight curves of different countries thus represent fairly accurately the fluctuations of temperature and atmospheric conditions like humidity, sunlight, etc. Sunlight is a favourable factor in colder countries, just as it is the reverse in the tropics. The reason is obvious. The climates of the different countries of the world have therefore a direct bearing on metabolism and body weight, especially in tuberculosis. Whilst Madras has only two fluctuations, a hill climate in South India like Arogyavaram has three, and colder countries like Norway and Denmark four, representing the seasons of the respective countries, viz., the hot and the cool seasons of Madras, the summer, autumn and cooler months of Arogyavaram, and the four classical seasons of Europe.

REFERENCES.

(1) Kesava Pai, M. and Venugopal, C. A. The Effect of the Seasons on the Body Weight in Pulmonary Tuberculosis under Hospital conditions in South India. *Madras Medical Journal*, July, 1928. Also read before the Congress of the Far Eastern Association of Tropical Medicine, Calcutta, December, 1927.

(2) Kesava Pai, M. On Seasonal Variations in Body Weight in Pulmonary Tuberculosis. *Transactions of the British Medical Association, South Indian Branch*, 3rd September, 1928.

(3) Lunde, R. The Effect of the Seasons on the General Condition and Increase in Weight of Tuberculous Patients. *Tubercle*, April, 1926, p. 323.

(4) Strandgaard. Changes of Weight amongst Consumptives. *Rev. Tubercle*, February, 1922, p. 229.

(5) Frimodt-Möller, C. Climate and Weight of Tuberculous Patients in South India. *Tubercle*, June, 1921, p. 385.

THE TREATMENT OF SEASICKNESS.

By A. SAHA, L.M.F.,

Ship's Surgeon, British India Steam Navigation Co., Messrs. Mackinnon, Mackenzie & Co., Calcutta.

DURING my ten years' experience as a ship's surgeon I have had many opportunities of treating seasickness, and a brief account of methods which have been tried may be of interest.

The disease or condition is experienced only in rough seas (although it may occur in perfectly calm weather in extremely susceptible subjects), and it is usually considered to be primarily an affection of the central nervous system. With the rolling and pitching of the ship in a rough sea there is disturbance of the endolymph in the semicircular canals of the labyrinth, and the disturbance passes through the vestibular portion of the auditory nerve to the cerebellum. As the centre of origin of the eighth nerve is very close to the centres of vomiting, vertigo, etc., in the floor of the fourth ventricle, the loss of balance brings with it headache, vertigo, and vomiting.

The chief symptoms of seasickness are headache, extreme wretchedness, giddiness, vomiting and, in some very severe cases, an almost choleraic type of diarrhœa. This last group of patients will tolerate nothing by the mouth, not even fresh limes or ice to suck. It is in this group that cardiac failure may loom threateningly.

Many people however soon adapt themselves to the movement of a ship in a rough sea, and only some 25 per cent. of passengers are seasick in a rough sea on their first voyage. Even these however for the most part gradually overcome the complaint after a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

few days, or in subsequent voyages. There is a residue of some one per cent., however, who never become adapted, and who are invariably seasick on every voyage. The choleraic cases are even fewer in numbers, but they are serious. In general, it may be said that women are "poor sailors" as compared with men. Infants in arms under six months of age appear to be quite immune, and such is also the case with many deaf-mutes.

Exciting factors appear to be constipation and starvation before sailing. The intending voyager would do well to have his bowels well opened and his stomach filled with suitable and nourishing food before embarking.

Some time ago certain European-American liners employed experts to investigate the biochemistry of seasickness, and their reports showed that associated with the condition was a change from the normal alkalinity of about pH = 7.6 of the blood towards an acidosis. From this it would appear that a useful precaution would be to swallow a solution of gr. 4 of sodium bicarbonate to 4 pints of water *ad lib.* before sailing, and I have found this measure very useful by way of prophylaxis. The auditory meati may also be cleared of wax and firmly plugged with cotton-wool; this meaure may very considerably alleviate the distress or even prevent the onset of the sickness.

With regard to drugs and medicaments, the less bulky, the better. Bromides or triple bromides may be of value, if used from the commencement of the voyage. One-drop doses of pure chloroform in iced water are of more value. Chloretone, cocaine, and adrenalin together are of value, and may be combined in such a prescription as the following:—

℞

Chloretone	gr.	xx.
Cocaine hydrochloridi	gr.	xx.
Sol. adrenalin hydrochloridi	m.	xx.
Syrupi simplicis	dr.	i.
Aquam ad	oz.	i.

Two or three minims of the mixture in a teaspoonful of iced water every half hour; repeated five or six times, as necessary.

Camphor and belladonna are also useful. They may be prescribed as follows:—

℞

Camphor monobromata	gr.	xxv.
Tinct. belladonnæ	m.	xx.
Tinct. gelsemii	dr.	½.
Syrupi simplicis	dr.	i.
Aquam ad.	oz.	i.

Dose; one drachm every half hour, repeated five or six times as necessary.

Belladonna may also be combined with adrenalin, as in the following prescription:—

℞

Tinct. belladonnæ	m.	xx.
Sol adrenalin chloridi	m.	xx.
Aqua laurocerasi	dr.	ii.
Aquam destillata ad	oz.	i.

One-drachm dose every half hour, repeated five or six times if necessary.

For very obstinate cases, where other remedies fail, morphia may be combined with atropine and dilute hydrocyanic acid as follows:—

℞

Acidi hydrocyanici dil.	m.	v.
Liq. atropini sulph.	m.	v.
Liq. morphinæ sulph.	dr.	i.
Syrupi	dr.	ii.
Aquam destillata ad	oz.	i.

A little less than a teaspoonful every half hour, repeated six to eight times as necessary.

On long voyages these or similar prescriptions may be followed in turn, allowing an interval of some four or six hours in between.

Hypodermic injections of morphia and atropine have given good results, but morphia may make the patient worse instead of better. B. W. & Co.'s Tabloid morphine sulphate gr. ¼ with atropine sulphate gr. 1|150 given hypodermically has given excellent results in my hands, even in severe and obstinate cases. In pregnant women it should be used in half doses and repeated when necessary.

"Vasano," introduced by Schering & Co., seems to be efficacious in a certain number of cases; and the same is the case with "Medinal"—a hypnotic—and chloretone as a sedative.

In severe cases with choleraic symptoms and severe diarrhœa, tinct. chloroform et morphinæ co. in 5-minim doses, repeated every hour for four or five doses yields excellent results. Intravenous saline transfusions may have to be resorted to, and give good results. These cases should be segregated, for they may be border-line ones, or even cases of true cholera, and therefore important from the point of view of port quarantine. I have seen such cases treated on board ship and recover; others sent ashore to hospitals on land; others die. On three occasions I have been able to send specimens of stools from such cases for bacteriological examination, but in all three no cholera vibrios were found. On the other hand the possibility of such cases being ones of true cholera should never be ignored.

The ætiology and treatment of aeroplane sickness are presumably identical with those of seasickness. This is one of the newer problems awaiting investigation by the medical profession.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

OBSERVATIONS ON THE EXCRETION OF ALCOHOL IN THE CEREBRO-SPINAL FLUID AND URINE AFTER ORAL ADMINISTRATION.

By B. G. VAD, M.D.,

and

N. W. KULKARNI, M.B., B.S.,

Sir J. J. Hospital, Bombay.

A PATIENT was picked up by the police and brought to the J. J. Hospital, Bombay, in an unconscious condition. No history was available and except for the smell of alcohol in his breath, a complete clinical and laboratory investigation revealed nothing to account for the coma. The diagnosis of alcoholic coma suggested itself, and on examination of the cerebro-spinal fluid alcohol was detected in it. But it was ascertained later that about half an hour before examination and lumbar puncture, the patient had been given an ounce of rum; and the question arose whether that ounce of rum could account for the presence of alcohol in the cerebro-spinal fluid within half an hour. According to Purves Stewart, with the possible exception of a positive reaction for alcohol in the cerebro-spinal fluid, there was no single clinical sign which is pathognomonic of alcohol poisoning of the central nervous system, etc. (*British Medical Journal*, January 17th, 1925, p. 113) and hence one would not have expected to find alcohol in the cerebro-spinal fluid within half an hour after taking only one ounce of rum.

In order to find out whether alcohol can be detected in the cerebro-spinal fluid, with or without any signs of drunkenness, within half an hour or less after taking only an ounce or less of rum, the following experiments were carried out. We selected our volunteers from the medical students and patients of this hospital. Amongst them were total abstainers, moderate and heavy drinkers. As shown in Table I, these persons were given various quantities of rum and the cerebro-spinal fluid taken at varying intervals from the different subjects by lumbar puncture, and examined for the presence of alcohol. Before taking the cerebro-spinal fluid, all the usual tests for drunkenness, such as making the patient walk on a straight line, making him write to dictation, and do arithmetical calculations, etc., were carried out and in none of them could they be elicited. A rise in blood pressure and an increase in pulse rate were detected in all cases.

In all these cases the urine was also examined for the presence of alcohol at different intervals (Table I).

Having found that after the administration of even a drachm of rum by the mouth on the empty stomach, alcohol could always be detected in the cerebro-spinal fluid and urine within half an hour in total abstainers, we decided to find out whether alcohol can be detected in the cerebro-spinal fluid and urine after oral administration of the B. P. tinctures. In these cases the following stock mixture was given in varying quantities, Mistura Sodæ et Calumbæ:—

℞

Sodii Bicarbonas ..	..	grs. xx.
Spiritus Ammoniæ Aromaticus	..	m. xv.
Tinctura Nucis Vomicæ	..	m. v.
Tinctura Calumbæ ..	..	ʒss.
Aqua Chloroformi ..	..	℥i.
M. Ft. Mist. ..	..	

Varying quantities of this mixture were given to the persons and the results obtained are shown in Table II.

The simple and easy test for the detection of alcohol in cerebro-spinal fluid and urine is the potassium bichromate test, which can be carried out anywhere. The only substance present in the normal cerebro-spinal fluid which may give a positive bichromate test is glucose, but in a number of cerebro-spinal fluids examined by us from various types of cases, including some of diabetes mellitus, the bichromate test was found to be negative in all cases, though the glucose percentage detected in some cases was up to 0.08 per cent. We therefore carried out a series of observations and found that glucose in the cerebro-spinal fluid will not give a positive bichromate test, unless it amounts to more than 0.16 per cent., a concentration which may sometimes be present in an extreme case of diabetic coma, which however, could never be mistaken for alcoholic coma or anything else.

Conclusions.

Alcohol can always be detected in the cerebro-spinal fluid and urine within half an hour of the administration of even a drachm of rum by the mouth on an empty stomach and in a total abstainer.

Alcohol takes a longer time for its appearance in the cerebro-spinal fluid if administered after food.

Alcohol can be detected in the cerebro-spinal fluid and urine earlier in total abstainers and when taken on an empty stomach; the habitual drinker requires a longer period and a larger quantity for excretion and detection of alcohol in the cerebro-spinal fluid and urine.

Alcohol can be found in the cerebro-spinal fluid of a person before he shows any signs of drunkenness and loss of mental control.

Glucose in the cerebro-spinal fluid is never present in a concentration sufficient to give a positive bichromate test for all practical purposes.

In view of these findings we entirely agree that as regards the tests for drunkenness and their applications, we find ourselves in the position of "as you were."

We are obliged to Colonel Vazifdar, Superintendent and Senior Physician, Sir J. J. Hospital, for giving us all the facilities for this investigation.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

TABLE I.

Detection of alcohol in the cerebro-spinal fluid and urine at different intervals after the administration of varying quantities of rum.

Serial number.	Patient, ward, and cot.	Total abstainer or otherwise.	Quantity of rum administered.	On empty stomach, or otherwise.	Interval to taking out C. S. F. by lumbar puncture.	Presence of alcohol in C. S. F.	Interval to passing urine after taking rum.	Presence of alcohol in urine.	Remarks.
1	Medical student.	Total abstainer.	One ounce.	On empty stomach.	30 minutes.	Present.	35 minutes.	Present.	Rise in blood-pressure and increase in pulse rate only.
2	Medical student.	Total abstainer.	One ounce.	On empty stomach.	20 minutes.	Present.	30 minutes.	Present.	Rise in B. P. Increase in pulse rate.
3	Ward XIV, cot 5.	Total abstainer.	One ounce.	On empty stomach.	15 minutes.	Present.	20 minutes.	Present.	Rise in B. P. Increase in pulse rate.
4	Ward XIV, cot 12.	Total abstainer.	One ounce.	On empty stomach.	10 minutes.	Present.	15 minutes.	Present.	Rise in B. P. Increase in pulse rate.
5	Ward XIV, cot 3.	Regular drinker.	One ounce.	On empty stomach.	10 minutes.	Absent.	15 minutes.	Absent.	Rise in B. P. Increase in pulse rate.
6	Ward XIV, cot 14.	Total abstainer.	One ounce.	On empty stomach.	5 minutes.	Absent.	10 minutes.	Absent.	Rise in B. P. Increase in pulse rate.
7	Ward II, cot 7.	Total abstainer.	Half ounce.	On empty stomach.	30 minutes.	Present.	40 minutes.	Present.	Rise in B. P. Increase in pulse rate.
8	Ward III, cot 4.	Drunkard.	Half ounce.	On empty stomach.	15 minutes.	Absent.	30 minutes.	Present.	Rise in B. P. Increase in pulse rate.
9	Ward II, cot 10.	Total abstainer.	Three drachms.	After light lunch.	30 minutes.	Present.	35 minutes.	Present.	Rise in B. P. Increase in pulse rate.
10	Ward XIV, cot 10a.	Occasional drinker.	Three drachms.	On empty stomach.	20 minutes.	Present.	30 minutes.	Present.	Rise in B. P. Increase in pulse rate.
11	Ward XIV, cot 14.	Total abstainer.	Three drachms.	On empty stomach.	10 minutes.	Present.	15 minutes.	Present.	Rise in B. P. Increase in pulse rate.
12	Ward XIV, cot 18.	Total abstainer.	Two drachms.	On empty stomach.	30 minutes.	Present.	35 minutes.	Present.	Rise in B. P. Increase in pulse rate.
13	Ward II, cot 1.	Total abstainer.	Two drachms.	On empty stomach.	20 minutes.	Present.	35 minutes.	Present.	Rise in B. P. Increase in pulse rate.
14	Ward XIV, cot 6.	Total abstainer.	Two drachms.	On empty stomach.	15 minutes.	Present.	25 minutes.	Present.	Rise in B. P. Increase in pulse rate.
15	Ward XIV, cot 9.	Regular drinker.	Two drachms.	On empty stomach.	15 minutes.	Absent.	20 minutes.	Absent.	Rise in B. P. Increase in pulse rate.
16	Ward III, cot 10.	Total abstainer.	Two drachms.	On empty stomach.	10 minutes.	Absent.	15 minutes.	Absent.	Rise in B. P. Increase in pulse rate.
17	Ward XIV, cot 8.	Occasional drinker.	One drachm.	On empty stomach.	30 minutes.	Present.	40 minutes.	Present.	Rise in B. P. Increase in pulse rate.
18	Ward XIV, cot 15.	Total abstainer.	One drachm.	On empty stomach.	20 minutes.	Present.	30 minutes.	Present.	Rise in B. P. Increase in pulse rate.
19	Ward XIV, cot 3.	Total abstainer.	One drachm.	After lunch.	15 minutes.	Absent.	25 minutes.	Present.	Rise in B. P. Increase in pulse rate.
20	Ward XIV, cot 7a.	Total abstainer.	One drachm.	On empty stomach.	10 minutes.	Absent.	15 minutes.	Absent.	Rise in B. P. Increase in pulse rate.

No signs of drunkenness or loss of mental control detected in any case.

TABLE II.

Detection of alcohol in the cerebro-spinal fluid and urine of the following cases, at different intervals after the oral administration of varying quantities of the stock Mistura Sodii et Calumbæ.

Serial number.	Patient, ward, and cot.	Total abstainer or otherwise.	Quantity of stock mixture administered.	On empty stomach or otherwise.	Interval to taking out of C. S. F.	Presence of alcohol in C. S. F.	Interval to passing urine after mixture.	Presence of alcohol in urine.	Remarks.
1	Ward XIV, cot 6.	Total abstainer.	Three ounces.	On empty stomach.	30 minutes.	Present.	40 minutes.	Present.	Pulse rate increased by 12 beats per minute. No other change seen.
2	Ward XIV, cot 1.	Not a total abstainer.	Three ounces.	On empty stomach.	30 minutes.	Present.	40 minutes.	Present.	Pulse rate increased by 7 beats per minute. Nothing else seen.
3	Ward XIV, cot 10a.	Total abstainer.	Two ounces.	On empty stomach.	30 minutes.	Present.	45 minutes.	Present.	Pulse rate increased by 10 beats per minute. No other change seen.
4	Ward XIV, cot 18.	Moderate but habitual drinker.	Two ounces.	On empty stomach.	20 minutes.	Absent.	30 minutes.	Absent.	Pulse rate increased by 8 beats per minute. No other change seen.
5	Ward XV, cot 4.	Total abstainer.	One ounce.	On empty stomach.	30 minutes.	Present.	40 minutes.	Present.	No change detected after 45 minutes.
6	Ward XIV, cot 14.	Occasional drinker.	One ounce.	On empty stomach.	30 minutes.	Absent.	45 minutes.	Absent.	No change seen.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LOCAL ANÆSTHESIA BY APOTHESINE IN GENERAL SURGERY.

By A. B. BANERJEE, M.B.,
Anæsthetist, Carmichael Medical College Hospitals, Calcutta.

THE extensive adoption of local anæsthesia in minor or major surgical operations speaks for itself. The help afforded by this is such that it is difficult to recall the position before this came into vogue, especially in chloroform, in patients at a high degree of risk.

The immense popularity of local anæsthesia can certainly be gauged from the great number of drugs which have lately cropped up for use.

In the following series of cases apothesine was the drug used.

The local effect of apothesine can very well be prolonged and augmented by the addition of suprarenal gland extract to the solution. The constriction of the local vessels produces a better, fairly prolonged and intensified analgesia (evidently by apothesine acting on the local nerves in concentration). This also obviates the necessity for a large amount of the anæsthetic.

For the success of any local analgesic, it is essential to keep in mind the osmotic tension of the solution. Any solution approximating to the normal physiological strength will produce painless swellings (whereas solutions of higher concentrations are apt to produce irritation or even local death). The non-isotonic fluid is not only likely to cause local irritation but has at times been known to have considerably delayed the process of healing. The solution in our series was made in normal saline.

Apothesine—a synthetic product, is the hydrochloride of gamma-diethyl-amino-propyl-cinnamate (P. D. & Co.). This substance occurs in small white crystals and is very soluble in water. It will keep for a reasonably long time if there is no contamination. The solution is quite easily made and can be sterilised by boiling.

Solutions of a strength varying between ½ to 1 per cent. have been used, but we found that one of 1 per cent. gives invariably admirable results. Two minims of adrenalin solution (1 in 1000) is added per ounce of the cooled sterile solution.

Encouraged by the work of Braun, adrenalin was made use of with fair impunity. With regard to the sterilisation of adrenalin solution there is one fact worthy of note. Adrenalin solution loses its efficacy if boiled in contact with an alkali, but it maintains its strength in association with a trace of hydrochloric acid.

There are some controversial points with regard to the use of adrenalin in the solution. Firstly a fairly large amount of adrenalin might produce a severe local constriction and thereby cause terrible after-pains and reactionary hæmorrhage. The second and the important remote effect is due to the toxicity of a large quantity of adrenalin being in the systemic circulation. This can be got over by using a small quantity only. Such a solution however will call for most careful technique in infiltration.

In all our operations either the infiltration or the regional method, or a judicious combination of both, was made use of.

MATERIAL AND TECHNIQUE.

The solution used must be prepared by the anæsthetist himself and it should be sterile, and as far as possible isotonic. The most convenient method is to dissolve the tablets (the synthetic suprarenin contained in these do not deteriorate in quality on boiling) in a glass beaker or a porcelain pot from which it can be drawn directly into the syringe. By boiling the tablet in a small amount of saline and then adding more till the proper amount is reached, the cooling takes very little time. The "Record" syringe has proved perfectly satisfactory for our purposes. Lately we have taken to using a local anæsthetic syringe with a bayonet catch for the needle.

The needle and syringes are to be boiled before use in plain water. For raising the small anæsthetic wheals in the skin a fine, short needle is used, whereas for deeper injections a longer and stouter needle with short bevel is best (2 to 4 inches in length). Non-breakable needles are very satisfactory. Needles must fit their syringes absolutely without leak.

A preliminary hypodermic injection of narcotics (morphine sulphate ¼ gr. with atropine sulphate 1/100 gr.) aids materially in the success of the anæsthesia by lessening the psychical stimuli in a fully conscious patient—a form of anoci-association. The visual stimuli are prevented by covering up the eyes.

It is a notable fact that in cases of perfect anæsthesia, the patient enquires at the end of the operation how much longer the operation is going to last.

Patients are prepared for operation in the usual way.

The following comprises the total number of operations done with 1 per cent. solution of apothesine with 2 minims of adrenalin solution per ounce:—

(*a*)	Hydrocele	34
	(*i*) With skin excision	12
	(*ii*) Without excision	22
(*b*)	Scrotal tumour	2
(*c*)	Inguinal hernia	14
	Strangulated hernia	13
(*d*)	Abdominal operations	9
	(*i*) T. B. mesenteric glands	3
	(*ii*) Appendicular abscess	3
	(*iii*) Internal strangulation by Meckel's diverticulum	1
	(*iv*) Kink of small intestine	1
	(*v*) Gastrostomy	3
	(*vi*) Colostomy	2
(*e*)	Cysts	66
	(*i*) Sebaceous	29
	(*ii*) Thyroid	3
	(*iii*) Dermoid	30
	(*iv*) Ovarian	1
	(*v*) Dentigerous	3
(*f*)	Other tumours	
	Epithelioma of back	2
(*g*)	Tracheotomy	21
(*h*)	Rib resection	2

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It is not possible to give a detailed description of the technique for different operations in a short paper. A few typical examples are given, indicating thereby the underlying principles. The technique varies according to the local anatomy, particularly the nerve distribution, without a thorough knowledge of which local anæsthesia cannot be successfully practised.

Although the preliminary administration of the narcotic makes the patient less receptive to external stimuli, yet it does not exempt the surgeon from being less vigilant in his task. Unless the surgeon is a person of cool temperament, calm judgment, and has a gentle but careful touch he is certain to fail in doing operations by this method, because tissues under local anæsthesia will stand cutting but will resent bruising or tearing. There should be perfect silence in the theatre, clanking of instruments should be carefully avoided.

Scrotal hydrocele.—The operation is performed thus. If the skin is not to be excised, a point is selected along the proposed line of incision and the needle is pushed in to the subcutaneous strata. Either the infiltration is then done, as the needle is gradually pushed in, or the same process is performed while drawing out the needle along the track through which it was inserted. The same process is repeated with the subfascial layer as well. The amount of solution necessary to do both these is about 2 c.c. (of the 1 per cent. apothesine-adrenalin solution).

When in the course of the operation the external tunic of the sac is reached, a few minims of the anæsthetic solution sprinkled on it acts admirably for further incision and eversion of the sac. Of the 34 cases operated on, 4 complained of a sense of tightness and oppression in the chest, preceded by lancinating pains up to the loins from the testes. The sensation complained of was sometimes so acute that stimulants were needed to rally them.

When the skin is to be excised, circum-injection is performed round the base of the scrotum; through the infiltrated area a vertical thrust is made into the cord; the veins are avoided by pulling up the piston before the solution is injected. The scrotal nerves are similarly infiltrated. The anæsthesia is completed by infiltration of the attachment of the gubernaculum.

A few of these cases showed œdema of the penis due to some extravasted fluid (within 24 hours), but they all showed absorption in 4 to 5 days time.

Only one case vomited at the close of the operation. *Superficial tumours* in any part of the body are treated in a similar way. The tumour itself is never touched by the needle. The lines of infiltration are made to appear like a rhombus within which the tumour lies; though the base of the tumour is infiltrated.

For *tracheotomy* the subcutaneous infiltration is easily carried out with a single puncture.

Amputations of toes, fingers or *digits* can be done by infiltration (subcutaneous) at the base of the terminal phalanx of the toe concerned. Two points are selected, one on either fold of the finger or the toe, and the solution is injected on either subcutaneous surface of the limb through these points.

Inguinal herniæ are best operated on in the following way, especially if they are not very large or very complicated by firm adhesions. The blocking of the ilio-inguinal, ilio-hypogastric and the external spermatic nerves is the keystone to success. It is necessary to make two skin punctures; the first is made about 1½ inches internal to the anterior superior iliac spine of the ilium. The needle is pushed in at right angles to the surface, piercing the aponeurosis of the external oblique muscle and muscle fibres of the internal oblique and transversalis, the solution being injected on the way in and on the way out. The needle is then re-inserted more obliquely towards the ilium and pushed on till it strikes the bone, injections being made continuously again while it enters and leaves. A third injection is made from the same puncture downwards towards the symphisis. This injection should reach below the aponeurosis of the external oblique. The external puncture is made at the external inguinal ring. From this point an injection is made along the inguinal canal. From both the punctures subcutaneous infiltrations are made at each side of the line of incision. When the hernia is irreducible, subcutaneous infiltration of the scrotum is also needed.

For resecting a rib four points of injection are employed, two over the intercostal space above and two over that below the rib. The points are so chosen that when injection is made through them, the portion of rib to be resected lies entirely within the area rendered insensitive.

After incising the skin wheals, the needle is pushed in vertically to the skin and injection is made between and into the intercostal muscle. When this is done the needle is withdrawn, but not completely, and is then directed so as to inject the soft tissues overlying the rib itself and the rib above and below it. About 14 c.c. are needed for resecting one rib.

For such an operation as that of *gastrostomy*, anæsthesia of the abdominal wall can be secured by local injection. Two punctures are made in the epigastrium, the higher one being close to the apex of the costal arch on the left side, and the lower at the lowest point of the line of incision to be made. The needle is pushed in vertically till it almost reaches the peritoneum. It is slightly withdrawn and is pushed more or less obliquely downwards several times, the injections being continued throughout the whole process. The same procedure is repeated several times from the lower puncture, the needle being obliquely directed upwards.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Since in this series there has been no occasion to perform splanchnic analgesia, any remarks regarding it are withheld.

The field or operations under local analgesia has been steadily and gradually increasing. The general practitioner of average class can perform the simpler operations with perfect safety, even in a very remote *moffusil* place.

I beg to record my indebtedness to the surgeons of the Carmichael Medical College Hospitals where these operations were performed, for their kind encouragement in my work and permission to publish the results.

SOME CASES OF *BACILLUS COLI* BACILLURIA.

By C. H. REINHOLD, F.R.C.S. (Edin.),
LIEUTENANT-COLONEL, I.M.S.,
Civil Surgeon, Delhi,
and
L. A. N. GREENWAY, M.R.C.S., L.R.C.P.,
House Surgeon, Hindu Rao Hospital, Delhi.

DURING the past year we have had seven cases of *Bacillus coli* bacilluria (which have been proved to be such by laboratory tests) pass through our hands, varying in degree from an ambulatory type to the most serious illness, which in one case terminated fatally.

The patients were all females and the age varied from infancy (18 months) through childhood (12 years) to mature middle age. One of the adults was unmarried and two were childless wives. They occurred at all seasons of the year.

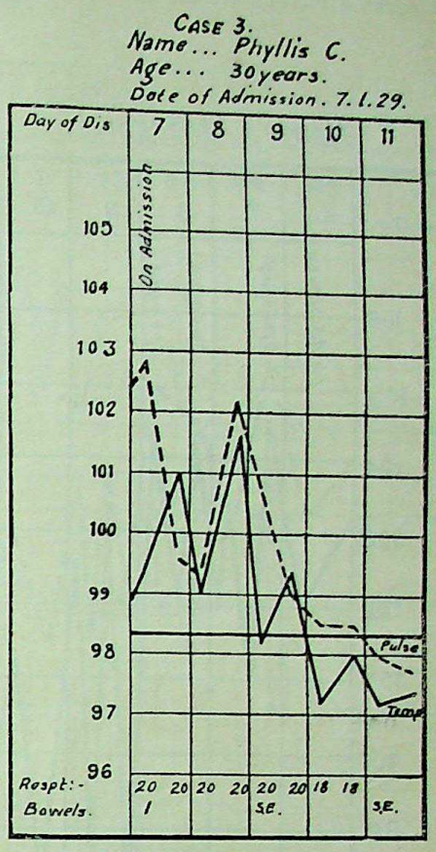
Taking them in order of severity, the lightest cases first:—

Case No. 1.—Mrs. D., aged 35, no children, complaining of feeling run down with frequency of micturition and pain over the bladder. The urine was strongly acid and showed a pure culture of *B. coli*, and a course of alkalies and autogenous vaccine produced a complete cure, without confinement to bed, in six weeks.

Case No. 2—Mrs. F. M., aged 24, never pregnant, had had bouts of fever elsewhere and troublesome frequency of micturition for over a year. When she came into our hands, she had a urine of high acidity and a pure culture of *B. coli* was isolated; a course of alkalies and autogenous *B. coli* vaccine rapidly relieved the symptoms and her general health, and a troublesome rash on the face was quickly relieved; though *B. coli* was still isolated from the urine long after her health was quite restored. In this case too there was no occasion to put the patient to bed.

Case No. 3.—Miss C., aged 30, was admitted on 7th January, 1929, on the 7th day of a fever, which had proved not to be malaria and sterile in bile salt culture for the typhoid group. On the 9th day *B. coli* was isolated from a catheter specimen of the urine and rapid defervescence followed alkalization of the urine and a morning draught of grs. xxx urotropine; she left hospital in a week as she was sailing shortly for England.

Case No. 4.—Margaret B., aged 18 months, was admitted on 28th March, 1929, after 5 days' illness and fever. Blood culture and the Widal test were negative, but *B. coli* was isolated from a catheter specimen of urine on the 30th. She remained very ill for 12 days and was much exhausted from lack of sleep; the fever began to intermit on the 9th day and finally stopped by crisis on the 13th. Alkalization of a very acid urine by potassium salts apparently was responsible for the



cure in this case, though a vaccine was started later and continued for 5 doses at 5 days' interval.

Case No. 5.—Mrs. P., aged 40 (4 children, youngest 6 years) was admitted to the Hindu Rao Hospital on 29th September, 1928, on the 8th day of fever. The blood culture was sterile and no malarial parasites were found. She had definite swelling and tenderness of the right kidney and the urine which was highly acid was loaded with pus. *B. coli* was isolated and an autogenous vaccine made. There was a polymorphonuclear leucocytosis which rose as high as 22,500, but alkalization and urotropine brought relief and defervescence at the end of fortnight from the beginning of the illness, and this was consolidated by a course of her own vaccine. She left hospital on 22nd October, 1928, and has remained well since. This was, in our opinion, a case of *B. coli* pyelonephritis, but probably due to an ascending infection from the bladder.

Case No. 6.—Mary P., aged 12, was admitted to the Hindu Rao Hospital on 15th June, 1928, after a week's fever at school in Dehra Dun. She caught a chill after getting soaked in the rain. She looked very ill, had abdominal pain and distension and a coated tongue. The early physical signs suggested pneumonia but these rapidly cleared up in two or three days, but the abdominal distension still continued with high fever and a rapid pulse. No malarial parasites were found and the Widal reaction was negative on the 25th, i.e., *B. typhosus* 1 : 40 +, 1 : 80 ±. Para A neg., Para B neg. Albumin was found in the urine which was scanty and highly acid and showed *B. coli*. This was grown in pure culture from a catheter specimen on the 27th. Urotropine was given and the temperature gradually fell when the urine was alkalinized with potassium salts; the child being discharged cured on 15th July, 1928, and has since remained well.

Case No. 7.—Mrs. W., aged 30 (one child, 18 months), was admitted on the 9th day of a fever on 29th April, 1929. The Widal reaction was negative and the blood

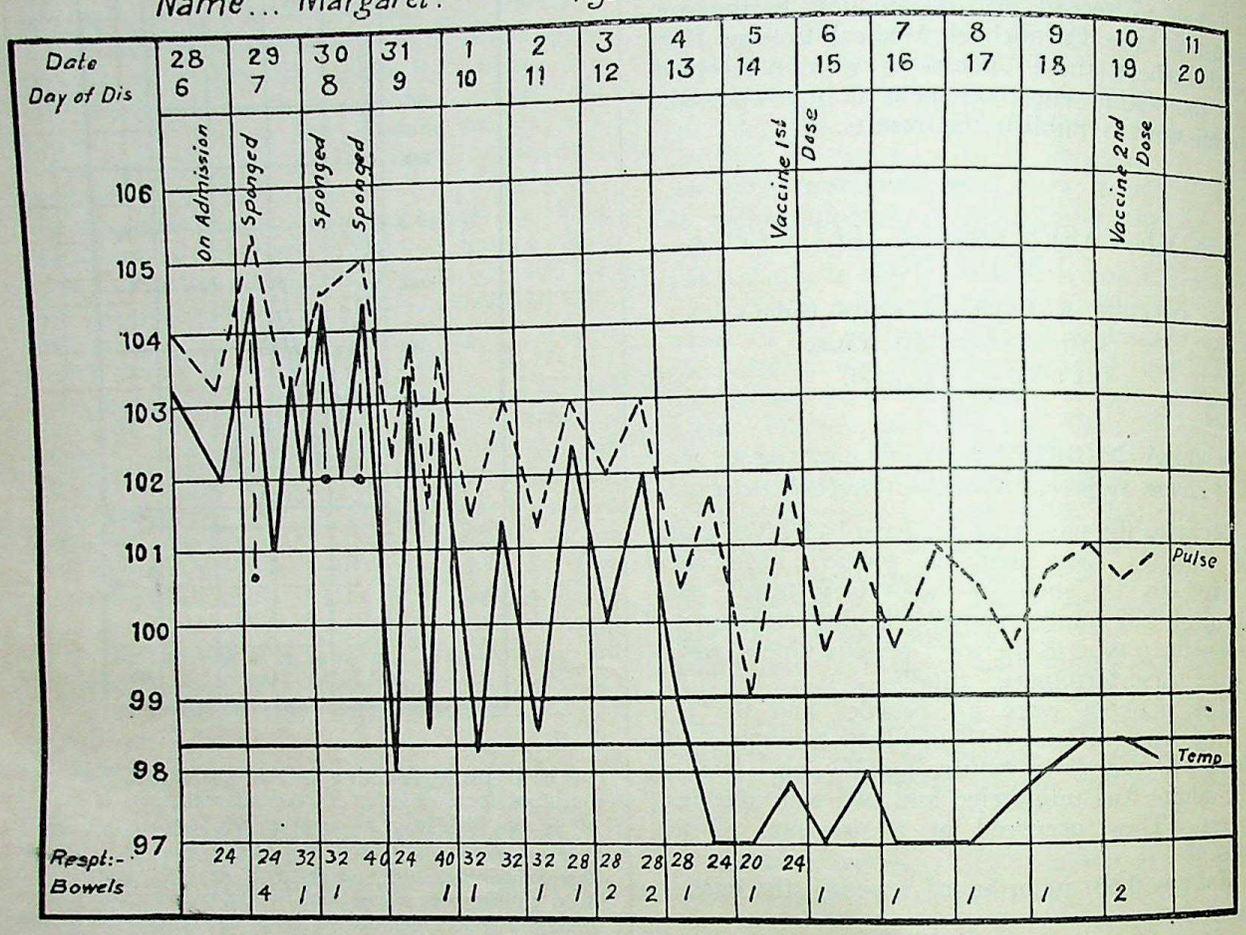
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

count showed a leucopœnia of 4,250. The pulse was rapid compared with the temperature and the latter ran very high to 105°F. with remission to 100°F. Diarrhœa was a marked feature and the case was very suggestive of typhoid fever, but the spleen was not enlarged, the abdomen not tumid, and the tongue not typical; and the pulse was never dicrotic and always very rapid. A pure culture of *B. coli* was isolated from

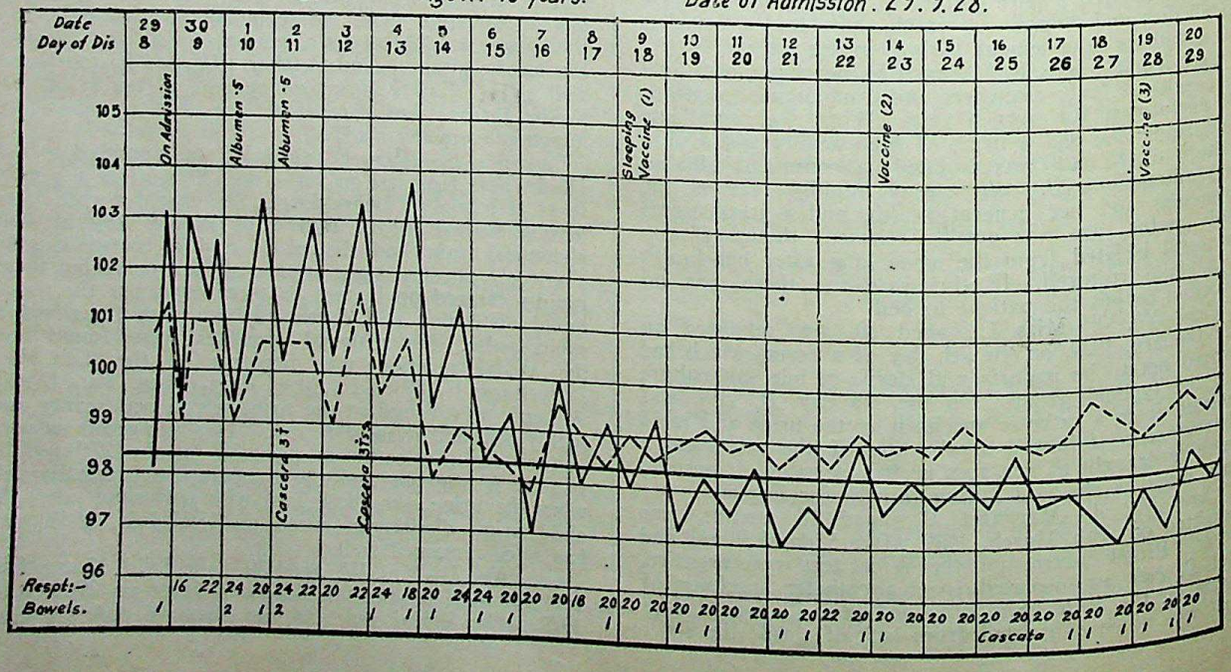
CASE 4

Name... Margaret. Age... 18 months Admission 28.3.29.



CASE. 5

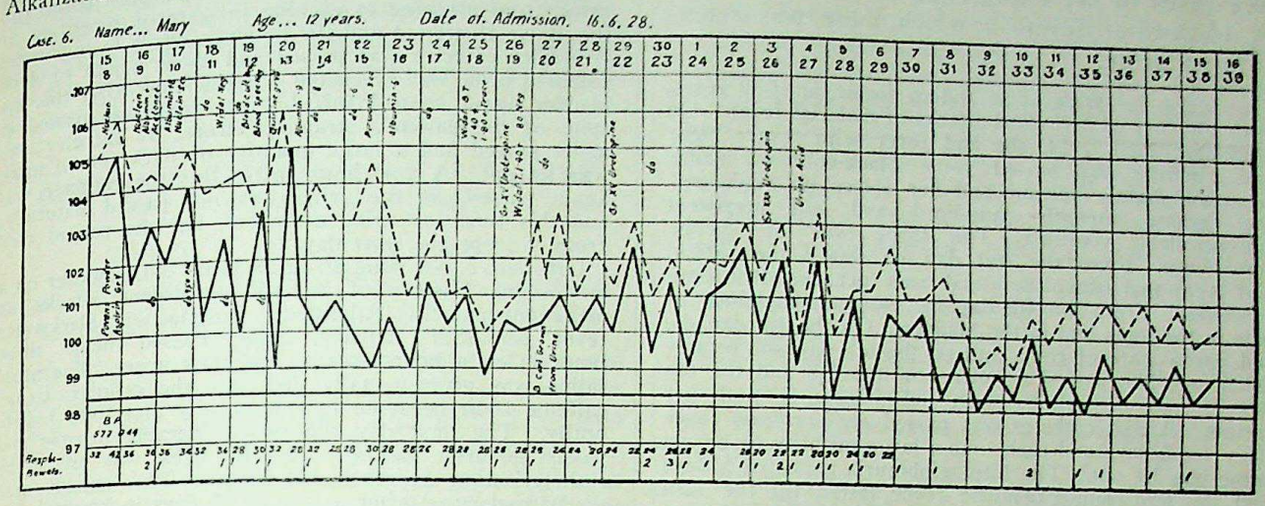
Name... Mrs. C. P. Age... 40 years. Date of Admission. 29. 9. 28.

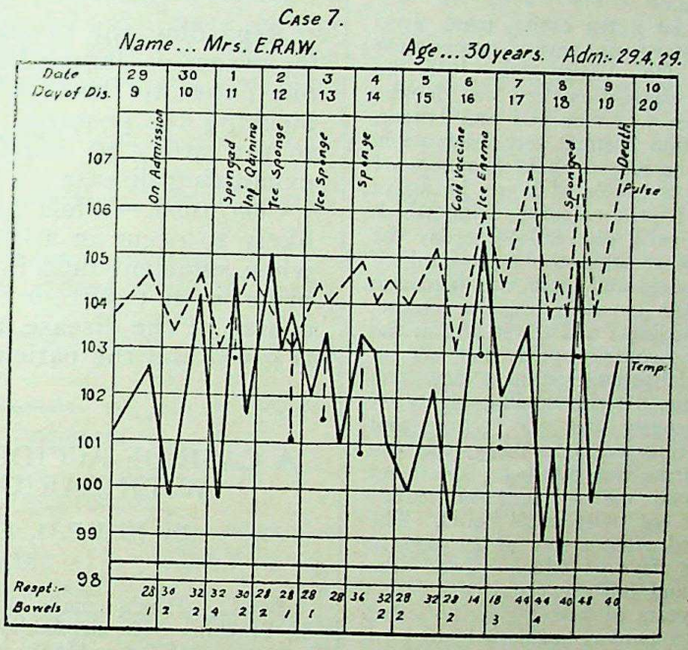


CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the urine on 2nd May, 1929, and a stock vaccine was started in anticipation of an autogenous one. Difficulty of micturition was a marked feature and enormous quantities of urine were drawn off with the catheter. Alkalization of the urine was difficult to accomplish as





is that it starts as a *B. coli* cystitis, and may ascend the ureter causing a pyelonephritis as in Case No. 5, or cause a general systemic infection.

vomiting was very troublesome and it was urgently necessary to support the heart with stimulants. She never showed any signs of reacting to treatment, and passing into a typhoid state with Cheyne-Stokes' respiration, died on 9th May, 1929.

In all the five cases admitted to the Hindu Rao Hospital, the typhoid group of fevers was suggested as the diagnosis at the start, but the high pulse-temperature ratio led us early to look elsewhere for a cause; the tongue too never had the typical features of clean tip and edges. A gratifying improvement in symptoms accompanied alkalization of the urine in all cases except the fatal one; we are not satisfied that urinary antiseptics were contributory to the cure, but believe that the *B. coli* vaccine helped to consolidate it. The limitation of the cases to females which has been remarked by all observers, has obviously an anatomical explanation. The two cases in mothers were not connected with recent pregnancies.

Our view of the pathology of the condition

A Mirror of Hospital Practice.

RETENTION OF URINE IN BLACKWATER FEVER.

By S. C. NAG,
In-Charge, Barbheel Tea Estate Hospital,
P. O. Bargang, Assam.

SUPPRESSION of urine has been seen in blackwater fever by many of those who have observed a large number of blackwater fever cases, but retention of urine, as far as I know, has not been mentioned in text-books, nor has it been recorded by any observer; the subject will, therefore, be of interest to many, I believe. From my little experience I have found that retention of urine does at times occur in cases of blackwater fever that are treated with plenty of fluids, and I believe that if a case of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

blackwater fever, in spite of ingestion of proper fluids, will not pass urine, a soft catheter should be passed. I have met with five cases in my experience of about 36 cases of blackwater fever in which there was retention of urine.

Case No. 1.—Wife of an Indian doctor, aged 30 years, with a history of periodical attacks of malarial fever. On December 23rd, 1914, she had fever with severe rigor and vomiting and passed some black-coloured urine. She was slightly anæmic and her spleen was enlarged, she became intensely jaundiced and had persistent uncontrollable vomiting. The urine was of syrupy consistence. From the 2nd day of illness the patient had occasional convulsions and was occasionally semi-conscious. From the 4th day the patient complained of pain in the loins and in the bladder. On the 4th day she fell into a state of coma and on the 6th day she became delirious. She passed no urine on the 5th and the 6th day in spite of saline given subcutaneously and per rectum. A soft catheter was passed *per urethram* twice daily for 2 days and each time a large quantity of brown urine was let out. The hæmoglobinuria persisted 5 days and the post-hæmoglobinuric fever lasted till the 12th day. The patient was cured.

Case No. 2.—A labourer of a tea estate, male, aged about 35 years, with a history of several antecedent attacks of malarial fever. On August 6th, 1915, he exhibited fever preceded by rigor, was very sick, looked slightly jaundiced, his spleen was enlarged and tender, he was therefore admitted into hospital for observation. Next day, at about 3 p.m., he passed about 3 ounces of dark brown urine and after a couple of hours he again passed the same quantity of dark coloured urine which was rather thicker than normal. The following day the urine was very dark and so was the stool—as if mixed with blood. Vomiting continued and there was hiccough and retching. The next day jaundice became intense, the patient complained of giddiness and thirst and in the afternoon, delirium and semi-consciousness had set in with retention of urine which continued next day. As the patient did not pass urine, notwithstanding plenty of saline fluid given subcutaneously and *per rectum*, and other fluids orally during consciousness, there was no shadow of doubt that the urine was retained. A rubber catheter was therefore passed and a large quantity of high coloured urine was let out twice in 24 hours. The patient was discharged cured after a stay of 29 days in hospital, during the first 8 days of which period the patient's temperature rose and fell every day.

Case No. 3.—Boy of 5 years of age, the writer's 3rd son, extremely susceptible to quinine, having a history of several attacks of malaria and four preceding attacks of blackwater fever during the past 7 months. In December 1922, the boy was getting fever, his spleen became enlarged and malaria parasites were found in the blood. A dose of 1½ gr. quinine hydrochloride was given and within the next few hours, with slight rise of temperature, the colour of the urine became almost black. The following morning the temperature fell but the boy became intensely jaundiced and looked distinctly anæmic. The urine was lighter in colour but not without a trace of hæmoglobin. Pain in the loins and epigastrium was complained of and there was vomiting. In the evening of the 2nd day fever rose again and, in spite of the usual fluid treatment, there was no urine for about 11 hours for which a small rubber catheter was passed and 2 ounces of hæmoglobinous urine was evacuated. From the 4th day there was no fever and the urine became clear leaving the boy in a state of extreme anæmia. (Five months after this the boy was again attacked with blackwater fever for the 6th time. Retention of urine occurred only during the 5th attack.)

Case No. 4.—A labourer of a tea estate, male, about 34 years old, was brought to hospital on January 9th, 1928, in a bad condition after over 24 hours suffering from blackwater fever. One hour after admission the patient passed a few ounces of chocolate coloured urine and about one hour after this he again passed a similar quantity. He vomited bile shortly after admission and there was intense jaundice. Sodii bicarb. was given with plenty of fluid by the mouth; saline was given *per rectum* and subcutaneously and caffeine sodii benzoate hypodermically. The next day the patient passed no urine from morning to evening in spite of repetition of the above treatment and the patient's effort to micturate. A rubber catheter was passed and about a pint of dark coloured urine was evacuated. Eight hours after this the bladder again seemed full, but no urine was passed in spite of the patient's straining effort. A catheter was again passed and a large quantity of dark brown urine was let out. A few hours after this the catheter was again passed, as the urine was not passed naturally, and this time too urine came out, but the patient died from syncope the next day.

Case No. 5.—A man, about 38 years old, labourer on a tea estate. History of several antecedent attacks of malignant malaria. Admitted to hospital with blackwater fever on 18th January, 1928. Passed urine three times in eight hours—scanty and inky urine. The usual saline was given rectally and into the cellular tissue, caffeine sodii benzoate hypodermically and sodii bicarb. orally. The next day the patient became drowsy and passed no urine naturally. Brown urine was let out by catheterisation twice in 24 hours. The patient was discharged cured after a stay of 11 days in hospital.

Regarding the cause of retention of urine, the writer is in opinion that the condition is due either to the debris of the residual urine blocking the posterior end of the urethra, or to the atony of the bladder caused by the exhausting disease.

Conclusion.—While suppression of urine is likely to occur in a case of blackwater fever when sufficient fluid is not given, retention of urine is not uncommon when, during the course of the disease, a large amount of fluid is given and the patient is exhausted.

A CASE OF ACCIDENTAL POISONING WITH BARIUM SULPHIDE.

By BHUPAL SINGH, B.A., M.B.,
Meerut.

B. L., Hindu male, aged 55 years, took about 1½ drachms of a depilatory powder (containing 1 part barium sulphide and 8 parts washing earth, or *botni mitti*) mistaking it for a laxative powder which he used to take as a home remedy, at 4 a.m. on April 14th, 1929. Vomiting commenced soon after and was persistent; he had 3 motions in the course of the next 4 hours. At 10 a.m. he noticed difficulty in lifting the arms and extending the legs and could not close the fist tightly.

I saw him at 5 p.m. on the same day: his condition was as follows:—

Tongue coated and dry.

Pulse slow, full and intermittent.

Heart sounds, booming—second aortic sound markedly accentuated—intermittent—missing a beat after every 5 or 6 beats.

Blood pressure, systolic—210.
diastolic—120.

Paresis of arms and legs—grip very weak, the forearm could be flexed with much difficulty but could not be extended at all. If the arm was lifted up it would fall down with the elbow flexed. The legs could be drawn up with some difficulty, but could not be extended.

Deep reflexes absent.

No sensory disturbance.

Brain absolutely clear.

He was given magnesium sulphate ʒi in solution every 2 hours and he took altogether 6 doses. He had 5 thin watery motions in the night.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

About 6 a.m. next day he felt as if the power of his limbs had suddenly returned. Just to try it he got up and walked about and moved his arms fully in all directions and his grip became normal. Since then he has been perfectly normal.

The chief point of interest in the case is the transitory nature of the paresis induced and sudden complete recovery of power after about 20 hours.

CEREBRAL SYMPTOMS CAUSED BY *PLASMODIUM VIVAX*.

By C. R. DAS GUPTA, M.B.,

Ancillary Kala-azar Inquiry, Indian Research Fund Association, School of Tropical Medicine, Calcutta.

WHILE attending the village treatment centre at Kaurapukur on Wednesday, the 29th May, I was asked to see a patient, a relative of one of the workers at the dispensary, at his residence, a little way off. I was told that the patient had been suffering from fever since the previous Monday—the fever having started with ague. I was also told that the patient had been very restless and apathetic since morning.

The patient was a thinly built boy of 12 or 13 years.

Temperature, about 104°F. *Pulse,* 130 p.m. *Respiration,* 30 p.m.

Lungs, clear. *Heart sounds,* normal.

Tongue, coated but moist. *Bowels,* constipated.

Urine, said to be clear and sufficient in quantity.

The patient complained of an indefinite pain in the region of the head.

Treatment advised—

Saturated solution of magnesium sulphate .. .. ℥p, statim.
Mist. cinchona febrifuge .. ℥p, b.d.
Sponging and ice to the head.

There being no slides with me, blood could not be taken at that time. The relative of the patient came to me at 7 p.m. and informed me that the patient had been in a comatose state since 12 o'clock. No medicine was given to him and consequently his bowels had not moved at that time.

Examination at 8 p.m. The patient was unconscious and restless.

Temperature, about 100°F. *Pulse,* 110 p.m. *Respiration,* 25 p.m. *Reflexes,* normal.

Blood taken for malarial parasites.

Treatment given—

Glycerine enema with good reaction.

5 grs. quinine bi-hydrobromide in 10 c.c. of normal saline, intravenously.

Icebag to the head was continued.

Next morning I was informed that the patient had regained consciousness in about half an hour from the time of injection and had been quite well since then. The place being a long way off, I could not go to see the patient on the next morning and I advised him to continue the mist. quinine sulph. ℥p, b.d., after a dose of magnesium sulphate. Since then the patient has been taking the quinine mixture regularly and has had no recurrence of the fever, or any other symptom.

While examining the blood smear I was astonished to find benign tertian parasites only—a fair number of growing trophozoites and scanty rings and gametocytes—in two thin films searched very thoroughly. I at once brought this to the notice of my chief, Dr. L. E. Napier, who was also satisfied that there were benign tertian parasites only. I gave slides to Dr. B. M. Das Gupta, Assistant Professor of Protozoology at the School to be examined; he reported as follows: "the slide shows a fair number of benign tertian growing trophozoites, scanty gametocytes and a few distorted rings—probably benign tertian."

After this I enquired into the periodicity of the fever and I was told that the patient had an attack of fever on the Monday with ague which rose very high. The fever subsided late at night and he was free from fever the whole of the next day. He got a second attack in the early hours of the Wednesday morning with vomiting. It was at this time that the blood was taken.

The magical effect of quinine clearly shows that the cerebral symptoms were due to malaria, while the periodicity of the temperature together with the findings of the blood examination would go to show that the whole illness was the result of an infection by benign tertian parasites—though such a case has not been reported previously.

Knowing as I do that without examining a very large number of slides or taking a culture it is not at all safe to give a verdict on the nature of the malaria parasite present, still I consider the periodicity of the temperature is very suggestive of the symptoms being caused by benign tertian parasites only. The only other explanation, as suggested by Lt.-Col. R. Knowles, is that it was a case of mixed infection, the cerebral symptoms being caused by malignant tertian parasites which were confined mainly to the internal organs, but there being so few parasites present in the peripheral blood, it was not possible to find them by examining two slides only.

My thanks are due to my chief, Dr. L. E. Napier, for permitting me to publish this short note.

TEMPORARY INSANITY FOLLOWING AN ATTACK OF MALARIA.

By S. C. SEN GUPTA, L.M.F.,

Resident Medical Officer, Lakhipara Tea Estate, Banarhat P. O., Jalpaiguri.

A TEA garden coolie, Hindu male, aged about 38 years, was attacked with fever accompanied by rigors during the evening of 2nd

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

April 1928, while I was away in the line on duty on the morning of 3rd April. I saw the patient in the folowing condition:—

Fever, 100°F.; respiration, normal; pulse, 94 per minute; tongue, moist and coated; spleen, enlarged 2 fingers below costal margin; liver, not palpable; heart and lungs, normal; bowels, constipated for 2 days.

Previous history.—The man had suffered from occasional attacks of malaria for the last two years; no history of syphilis was available.

Personal habits.—The man was addicted to drinking and tobacco.

Family history.—His wife and children also suffer from malaria now and then.

The man is moderately healthy, not anæmic; he can work hard in the garden.

As his blood could not be examined, I made a clinical diagnosis of malaria.

I gave him a good dose of castor oil and then quinine mixture, t.d.s. (quinine sulph.—gr. v per dose). The man was relieved from fever and apparently well on 4th April. On 5th April he was well all day long. During the night he woke up suddenly at about 11-30 p.m., became boisterous and chased his sons and wife with a knife. Gradually he became more and more noisy. Nobody could either check him or approach him.

In the morning when I was called, I saw the patient tied to a post in a naked condition. His eyes were congested. He was very noisy, using abusive language to whomsoever approached him. It seemed to me that he had gone mad absolutely. On examining him I found the following condition:—

Fever, nil; pulse, comparatively rapid; respirations, a little hurried, spitting now and then; tongue, slightly coated and moist; pupils, dilated to some extent; spleen, as before enlarged.

No other abnormality could be detected. However, I tried to give a big dose of bromide mixture with tincture of hyocyamus, but the man was determined not to take it until I administered it by the help of a mouth gag and tongue forceps; there was no effect till 7th April.

On 8th April at about 9 a.m., when I saw the patient again I thought that the previous attack of malaria might be the cause of his trouble. I then gave 1½ ounces of magnesium sulphate and twenty grains of quinine sulphate in mixture form once only by the help of stomach tube.

During the evening of the same day he had 16 loose motions and became weak and quiet too.

Next morning (9th April) when I went to see him, to my utter surprise, I saw the patient perfectly calm and quiet, but he neither spoke nor replied to anybody.

Again I gave quinine mixture (quinine sulphate gr. xv) once only.

From 10th April he became all right, speaking well. When asked how he felt all these past days he told me that he could not remember anything, but felt very weak. He thought that some evil spirit might have attacked him during his sleep. Since then he is all right and working well.

A CASE OF STAPHYLOCOCCAL SEPTICÆMIA.

By HARENDRA NATH BAGCHI, M.B. (Cal.),
Assistant Surgeon, Calcutta Police Hospital.

R. S., Hindu male, aged 21, a male nurse of the Calcutta Police Hospital was admitted into hospital on 3rd September, 1928 for:—

Continued fever, headache and generalised pain all over the body; duration 2 or 3 days.

He gave a history of chill. The patient took to bed from the date of admission into hospital, being prostrated by fever, there was a perceptible spleen, but his liver was normal. His heart and lungs were also normal. He had faint rose spots, especially noticeable over the lower abdomen, which faded the next day. His tongue was clean and there were no sordes on the teeth. His gums were healthy and bowels constipated.

No malarial parasites were found and his white blood count was 7,000 per c.mm. From the 4th day onwards there was noticed a moderate degree of tympanites, though there used to be two loose motions a day. There was no delirium and the patient used to sleep well at night.

On the 4th day after admission into hospital the blood was sent for culture for bacteria and for leishmania, and the report was a pure growth of *Staphylococcus albus.* The patient was passing scanty, high-coloured urine which on examination showed specific gravity 1,030, acid, albumen present (marked trace), no sugar, bile present, a few granular casts. From the beginning of the second week of his illness the patient developed slight bronchial catarrh which lasted the whole of that week.

As the spleen remained palpable I did the antimony test for kala-azar which was negative.

On 20th September, 1928, I sent blood for culture again as well as for Widal reaction against T. A. B. and sent his stool for culture. The report again showed a growth of *Staphylococcus albus,* the Widal reaction was negative for T. A. B. and his stool culture result was a growth of *B. coli* and *B. lactis ærogenes capsulatus.*

The patient made an uneventful recovery.

Differential diagnosis:—Typhus fever, in favour in which are the following points: fairly abrupt onset, with a continued fever lasting about 2 weeks, followed by a rapid lysis of temperature, eruption of rose spots on 4th or 5th day about the abdomen and bronchial catarrh.

Against this diagnosis.—No lice were found on the patient, there was no moderate leucocytosis and blood culture showed a growth of *Staphylococcus albus.*

My thanks are due to Major B. G. Mallya, F.R.C.S. (Edin.), I.M.S., Police Surgeon, Calcutta, for kindly giving me necessary permission to publish this case in the journal.

A CASE FOR DIAGNOSIS.

By PRAFULLA KUMAR BACHASPATI, L.M.F.,
Joari Charitable Dispensary, Joari P. O.,
District Rajshahi, Bengal.

THE patient was a Mahommedan boy, aged about 5 years. He was of a dark complexion. His chief complaint was fever and a peculiar sound simulating the chirping of tiny birds inside the head, which could be heard and felt by the patient himself and his guardians.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The patient located the sound to be on both the temporal regions, occiput, and angle of the jaw, right side. Duration of his complaint was 2 months.

Past history.—No history of hereditary syphilis or rheumatism. The patient gives a history of occasional epistaxis.

Lungs—normal.

Heart—First sound at the apex seemed to be a little prolonged. Second sound at the pulmonary region was unduly accentuated. Aortic second sound was normal.

Pulse—rapid and of moderate tension.

Abdomen—Spleen 3 inches below the costal arch and of soft consistency. Liver 2 inches below the costal arch. No tenderness over the spleen or liver. No abnormal pulsation felt by hand or through auscultation over the abdomen.

Digestive system—Appetite good. Digestion good. Tongue—quite clean. Bowels—regular. He was anæmic to a great extent. Sense of hearing was good.

I put my ears over the angle of the jaw, right side, and over the entire head. I was astonished to hear the peculiar sound over the spots already noted above. These sounds disappeared on firm pressure over the angle of the jaw, right side. The sound was accentuated by the pressure of the stethoscope. I took the blood for the aldehyde test; it was positive for kala-azar. The patient would not submit to a course of intravenous treatment. Intramuscular injections of antimony with albolene and creo-camphor were given. Intravenous injections were not possible, as the very sight of the needle made the patient jump.

(*Note.*—We have not been able to arrive at any conclusions with regard to the cause of the noises in the head. Perhaps some reader of the *Gazette* might be able to make some suggestions.—EDITOR, *I. M. G.*)

NOTES ON A CASE OF HUMAN HERMAPHRODITE.

By M. C. ALBUQUERQUE, L.R.C.P. (Lond.), M.R.C.S. (Eng.), L.M. (Rotunda),

Lady Medical Officer, Maternity Hospital, Bangalore,

and

T. SESHACHALAM, L.R.C.P. (Lond.), M.R.C.S. (Eng.),

Assistant Surgeon, Victoria Hospital, Bangalore.

A WOMAN, aged 27, presented herself at the Maternity Hospital, Bangalore, with the following history:—

When she was a child of five years two swellings, each of the size of a small cherry, were noticed in the groin by her parents. The swellings increased in size very gradually. She was married when about fifteen years of age. There is no history of menstruation. She lived with her husband for seven years, and during this period was having sexual intercourse and responded spontaneously. As she had no children the husband married again. Both the wives are now living with the husband. Within the last six years the swellings have very rapidly increased in size, and as they caused pain she sought medical advice.

The woman was well built. The feminine secondary sexual characteristics were very well developed, but curiously enough she had no shyness in speaking of sexual matters.

On examination two cystic swellings, one in each groin, of about the size of a lemon were found (Fig. 2). On palpation both the swellings were tender, irreducible, cystic in character and had no impulse on coughing. On vaginal examination it was found that the vaginal canal was about 4 inches long, and that neither the cervix nor the body of the uterus could be felt. Two roundish swellings each of the size of a small marble were felt, one on either side of the middle line in the pelvis. The clitoris was of normal size.

Operation.—With the provisional diagnosis of bilateral hydrocoele of the canals of Nuck an operation was performed. On making a longitudinal incision and separating the cysts from the surrounding structures,

Fig. 1.

it was found that there was a solid lump with a large cyst attached to its anterior aspect. Tracing these

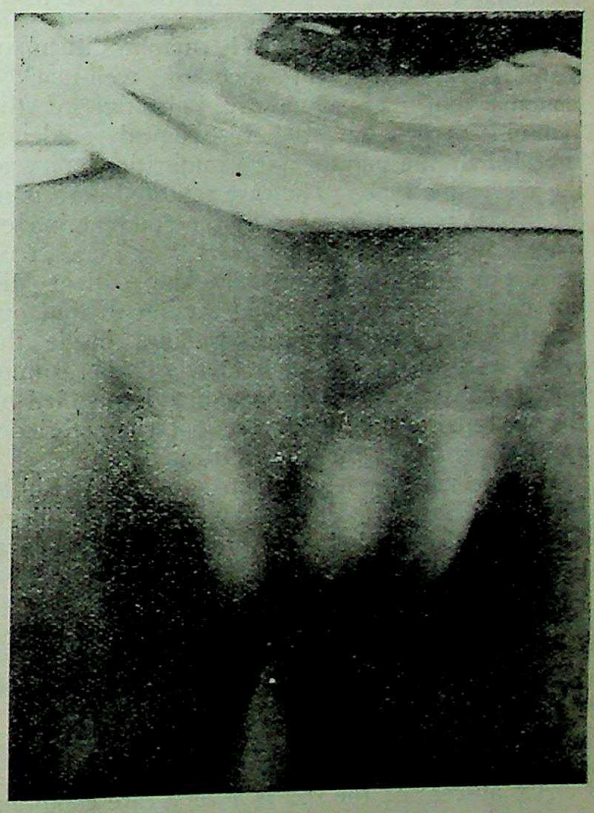


Fig. 2.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

further upwards there was a pedicle in the inguinal canal. The pedicles were ligatured, the cysts were removed and the incision sutured. The patient made an uninterrupted recovery.

The swellings measured 9 cms. in length and 19 cms. in circumference. The entire structure was fluctuating to the touch and there was a relatively soft solid structure behind. On sectioning one of the cysts in the sagital plane, it was noticed that it was bilocular and that the two compartments were communicating at one place by a small aperture in the septum. The fluid contained in the cyst was clear. The wall of the cyst was highly vascular. The entire cyst could be easily pealed off from the solid portion (Fig. 3).

Fig. 3.

Microscopic Examination.—The material was fixed in 10 per cent. formalin and paraffin, sections of 10μ thickness were cut and stained with Delafield's hæmatoxylin and eosin. The solid portion consisted of spermatic tubules, but spermatozoa were not present in the lumen. Degenerative changes of the tubule were evident. There was a relative increase in the connective tissue matrix.

The occurrence of true hermaphroditism in man is rare. The presence of well-marked mammæ and the vagina are indicative of the feminine type, but the histological evidence revealed by the microscopic examination point to the masculine type. The case reported here is in all probability an instance of the combination of male and female characters, i.e., a true hermaphrodite. Unfortunately the patient did not consent to an abdominal section to find out whether the two rounded swellings inside the pelvis were ovarian in character. The presumption that they are ovarian in nature is justified by the well-marked secondary sexual characteristics and the periodic strong desire to mate.

We are very greatly indebted to Dr. A. Subba Rau, Professor of Physiology, Medical College, Bangalore, for the help given to us in the preparation of this paper.

A CASE OF ABSCESS OF THE IRIS.

By JADAVJI HANSRAJ, D.O.M.S. (Eng.), L.M. & S. (Bombay),

Consulting Ophthalmic Surgeon, Fateh Majzil, New Queens Road, Bombay.

AN abscess of the iris is a very rare condition, so much so that one cannot find any description of the condition in a text-book like Fuch's. It is the rarity of the condition which has induced me to publish the notes of a case which came to me in the out-door department of Ramwadi Free Eye Hospital.

A patient, aged 35 years, labourer by occupation, presented himself at the R. F. E. Hospital with pain and redness in the left eye. The only history he gave was of rubbing the eye with a coarse cloth six days before.

On examination there was marked ciliary injection, photophobia, and lacrimation in the affected eye; the ciliary injection was much more marked on the temporal side, i.e., on the side on which abscess was situated. The cornea was absolutely clear. The temporal half of the anterior chamber was occupied by an oval substance, yellowish white in colour, absolutely immovable either with the position of the patient or by pressure on the eyeball itself. The pupil, jet-black and elongated vertically, could only be seen on the nasal half, the temporal half and the portion of the iris peripheral to it being completely covered by the mass in the anterior chamber. The visible portion of the iris was slightly muddy, the crypts on its anterior surface being obliterated and the pattern of the iris lost. The tension of the eye was definitely above normal. The vision in this was finger-counting at one foot only; the other eye, of course, had full vision.

A diagnosis of dislocated lens in the anterior chamber was made. The points in favour of such a diagnosis were:—(1) the colour and appearance of the mass, (2) the shape and size of the mass, and (3) increased intra-ocular tension with signs and symptoms of secondary glaucoma.

Treatment.—An immediate operation was decided upon and the patient was prepared for operation. An incision was made in the outer half of the cornea so as to facilitate the delivery of the supposed dislocated lens. As soon as the anterior chamber was opened, along with a little aqueous humour muddy coloured pus began to ooze out and the protuberant mass in the anterior chamber, described above, began to disappear. On irrigating the anterior chamber, it was observed that pus was coming from an opening in the iris on the outer half. The outer layers of the iris were changed in colour so as to present quite a muddy colour and formed a thin capsule of the small sac which contained the pus. The eye was washed and bandaged.

After-treatment.—On the day of the operation 100 c.c. 1 per cent. solution of mercurochrome was injected intravenously. In the evening the patient had a rigor and the temperature went up a little, most probably due to reaction to mercurochrome. The eye was dressed as usual with atropine drops, and bandaged. Two more injections of mercurochrome were given on alternate days. The iris cleared entirely, but posterior synechia resulted. The patient regained vision up to finger counting at 4 feet and is improving gradually. Of course the pain and injection are gone. The patient is still under treatment.

Ætiology.—In this case there was no ectogenous infection as far as one could find. Endogenous infection was the only explanation one could put forward. It is quite probable that the focus of infection was in the root of some tooth or teeth, as the patient was suffering from a very bad type of pyorrhœa alveolaris.

The patient while rubbing the eye inflicted a certain amount of trauma to his iris and, the infection being there already in the blood vessels of the iris, an abscess started. Looking to the vascular nature of the iris one would have expected a mild form of iritis instead of a localized abscess, but very often the ways of nature are beyond our logic.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A CASE OF DIVERTICULUM OF THE ŒSOPHAGUS.

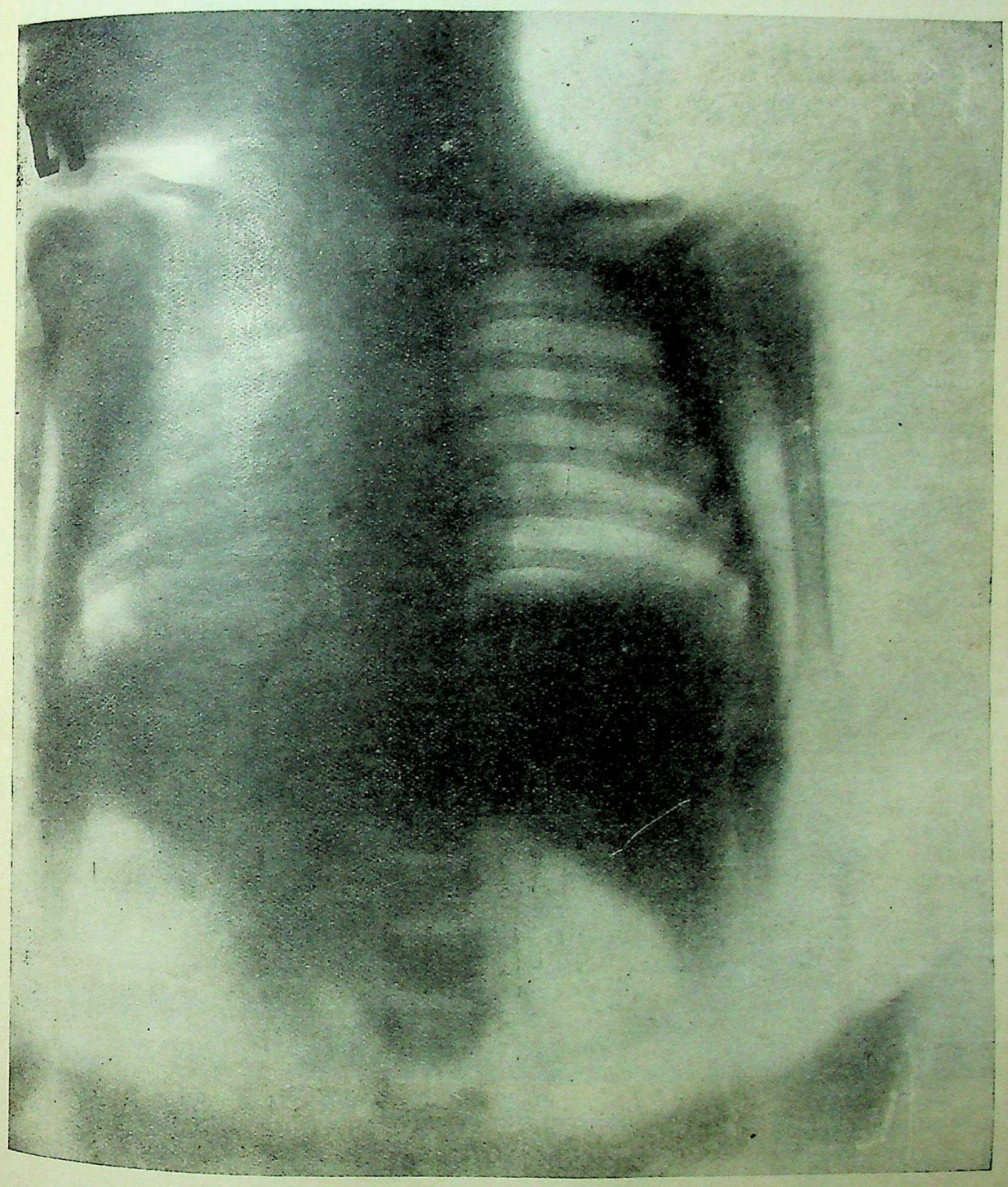
By C. D. TORPY, L.M.D.,

Military Assistant Surgeon, In-charge Radiological Department, British Military Hospital, Trimulgherry.

Boy M., aged 2 years, suffering from sore throat and dysphagia. Enlarged tonsils were found on examination. These were removed by the guillotine. Dysphagia still persisted even after operation. The child was then taken to Bombay where a diagnosis of "foreign body in the œsophagus, possibly a fish bone" was made by radiological examination.

Symptoms continued to persist, and the child was then brought back to Secunderabad.

A skiagram was first recorded of the neck and upper chest, but there was no *x*-ray evidence of a foreign body. The patient was then given barium emulsion to swallow, and its passage through the œsophagus was noted under the *x*-ray screen. An œsophageal pouch, the size of a rupee, at the level of the upper œsophagus was seen to fill and gradually to spill over from the

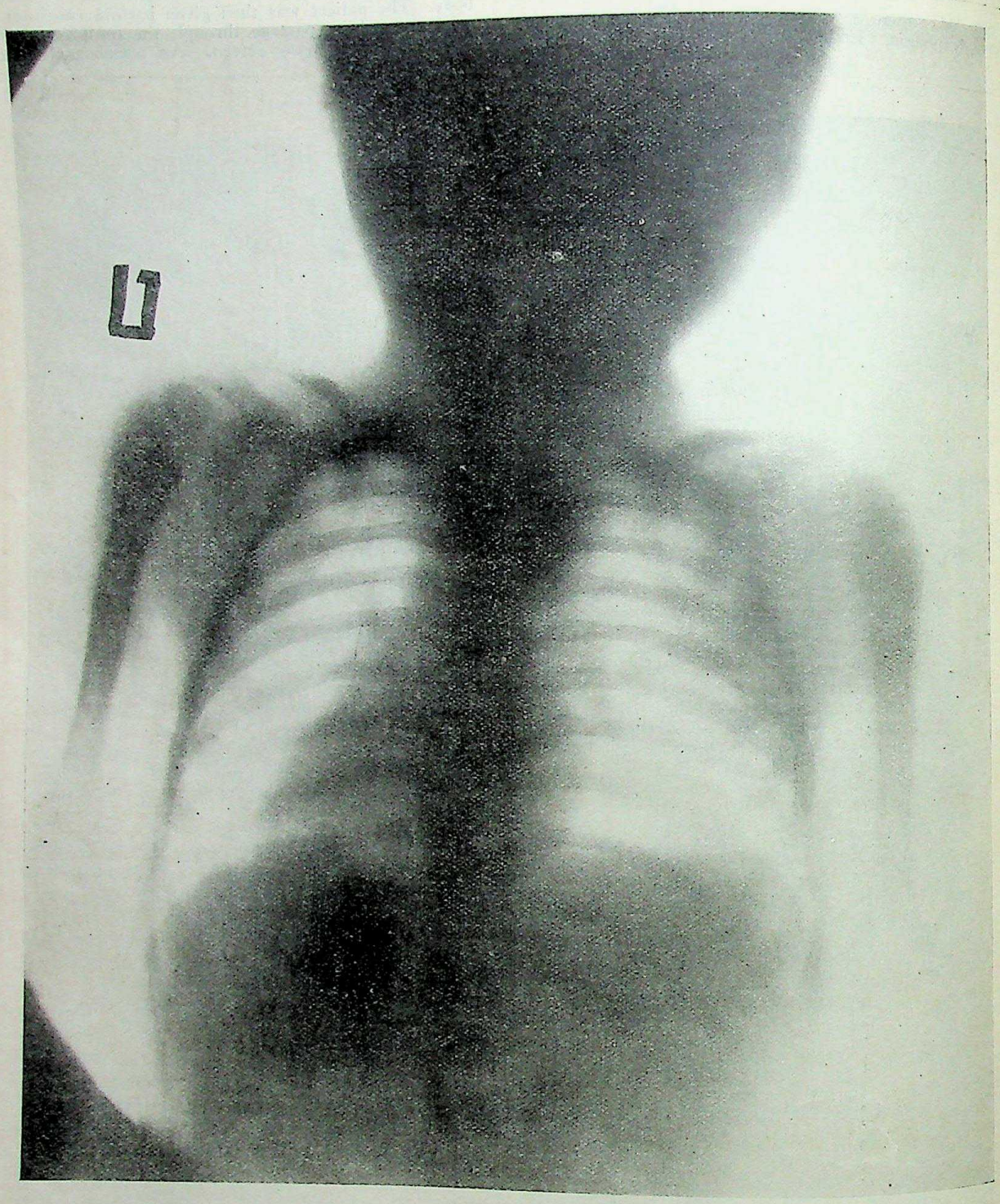


Skiagram before barium meal.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

upper limit of the sac. The smooth roundness of its lower pole, and its symmetry proved it to be an œsophageal diverticulum. Another skiagram of the pouch was recorded.



Skiagram after barium meal.

The points of interest are:—

(1) Dysphagia was not noticed so long as the child was on liquid or semi-solid food. Symptoms were first noticed when the child was put on solid food.

(2) The child was suffering from hypertrophied tonsils as well, this naturally did not facilitate a correct diagnosis in the first instance.

(3) The diverticulum was not and could not have been diagnosed except with the aid of an opaque meal.

My thanks are due to the Officer Commanding, the British Military Hospital, Trimulgherry, for his kind permission to publish these notes.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail)

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones.

The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.

Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

OPOCRIN HEPAR.

Dose in Pernicious Anaemia 18 pills per day.

Special liver extract for Pernicious Anæmia, Antitoxic effects, to favour intracellular absorption of Glucose, and for diabetes when due to defective functioning of the liver.

Price, bottle of 50 pills Rs. 3.

For COUGHS whatever their origin

ONE GRAMME CREOSAL CONTAINS		
Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY
P. O. Box 226, MADRAS

Telegrams: "AMPSALVAS."

P. O. Box 7861, CALCUTTA.
P. O. Box 134, RANGOON.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

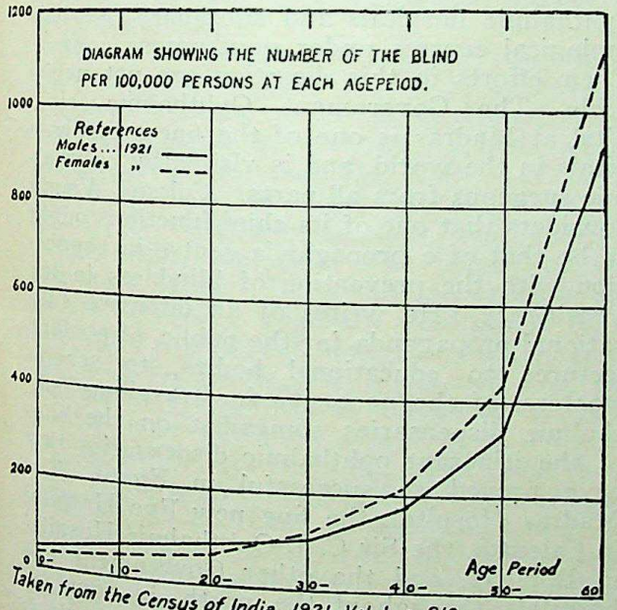
SEPTEMBER.

PREVENTABLE BLINDNESS IN INDIA.

INDIA is a land of blindness, much of which is peventable. The 1927 census for England and Wales shows that there were 119 blind persons per 100,000, the corresponding figure for India in 1921 being approximately 152—a marked increase on the figures for 1911, when recording was perhaps less accurate. The 1921 census for Madras Presidency shows a general figure of 153 blind per 100,000.

The proportion of blind among the general population in India compares with that in Great Britain as 152 : 119, but it is obvious that the relative, as well as the absolute, number of blind persons in India is greatly in excess of that in Great Britain.

A fact which emerges from the census returns is that blindness is essentially a disease of old age. The graph depicted in the 1921 census shows that the proportion of blind in



Taken from the Census of India, 1921, Vol. I. p. 212.

the population rises with succeeding age periods. This graph is here reproduced. At thirty years of age the proportion of blind is only about 117 per 100,000; at fifty years of age it has risen to a proportion of about 380 per 100,000; in old age it rises to a figure of some 900 per 100,000. Women suffer more than men, there being 1,047 blind women for every 1,000 blind men. Mr. J. T. Marten, I.C.S., talks of the dry, hot climate; small, dark, and ill-ventilated huts; dust—always an important element in the Indian atmosphere—the long hours of Indian children at school without meals, the strain of child education in ill-lighted and ill-ventilated schools. The higher Indian castes are relatively free from blindness, but blacksmiths and durzies and those whose work compels them to work in close or smoky atmospheres are stated to have much more blindness than agricultural castes or jungle tribes. Further, cataract is the special foe of the old in India, whilst religious mendicants and professional beggars naturally show a very high proportion of blind. Dr. E. Jackson points out the cumulative action of all causes of blindness and the fact that minor ailments, insufficient to rank as blindness, starting early in life, come into operation later. He says, "blindness is the summing up of strain, injury and disease that has gone before." It is, however, that blindness which occurs in the first five years of life which forms the main nucleus of the total blind, and much of this is preventable. In western countries the most important cause operating in this period is ophthalmia neonatorum which is estimated to be responsible for 8 per cent. of the total blind. We do not suppose that gonorrhœa is less prevalent in India than in those countries, and, with India's customs of "dirty midwifery," ophthalmia neonatorum must play an important part in the causation of preventable blindness in this country.

The British figures show that of 46,822 blind persons in a population of 39,290,000, 258 were under five years of age, the Madras statistics that out of 37,162 blind persons in the presidency 768 were under five years of age. These comparative figures would appear to show that ophthalmia neonatorum is an even more important cause of preventable blindness in India than it is in Great Britain, but, as we shall see later, it does not necessarily rank first.

How much of the blindness in India is preventable? Until we have more information it is impossible to state, but the *Annual Report of the Government Ophthalmic Hospital for Madras* for the year 1928 by Lieut.-Col. R. E. Wright, I.M.S., the Superintendent, which has recently come to hand, and is reviewed on page 534 of this issue, contains some most interesting information with regard to the Madras Presidency and the hospital which he and his predecessors have raised to such a high pitch of efficiency and eminence.

Colonel Wright considers that the first step to take is to enquire into the cause of blindness during the first five years of life. And here keratomalacia stands out pre-eminent in the Madras Presidency, and is apparently more important than ophthalmia neonatorum. Large portions of the poorer people in the Madras Presidency are in what may be termed the "twilight zone" as far as their nutrition

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is concerned, and a small change in their dietary, due to poverty, may precipitate keratomalacia, even in adults. Here the method of prevention is obvious; it is the poverty of the Indian ryot and the want of vitamines in his dietary that cause this disease. Give him better agriculture and an improved dietary, and keratomalacia will disappear. This is an easily preventable disease, but it is easier to talk of curing poverty than to accomplish it. The chief remedies appear to lie along the lines recommended by the Linlithgow Commission.

Also important in the list of early preventable causes comes the application of irritant remedies to the eye in cases of eye disease; and then ophthalmia neonatorum. The former is a terrible curse in India. The itinerant *hakim* and *kaviraj* have a lot to answer for in this connection, as have the coucheur of cataract in the Punjab and United Provinces also. Until crude and violently irritant remedies for conjunctivitis and similar affections cease to be hawked about the bazaars of India, much preventable blindness will ensue. As to ophthalmia neonatorum, the position is simple; the substitution of clean midwifery for dirty, the instillation of weak silver nitrate solution into the eyes of every infant at birth, can prevent this. This, at least, is a matter to which the public health authorities of India are fully awake.

Perhaps next in the list comes congenital syphilis. Again, this is preventable. It is a question of pre-natal clinics and pre-natal treatment of the mother. Even to-day smallpox is a most important cause. Again, the line of prevention is clear. "Good vaccination saves more eyes than all the eye hospitals of India put together," writes Colonel Wright, and it is deplorable that the rules and regulations with regard to efficient vaccination in infancy in India are being restricted.

Trachoma varies considerably in its importance as a cause of early blindness in different parts of the peninsula and in different races. In this disease many eyes are lost through the application of too drastic and irritant remedies, and this group consequently overlaps the second. It is more common in Mahomedan communities than, for example, in the southern Hindus. Lastly, conjunctivitis eczematosa or phlyctenular conditions may be mentioned in the list of remediable causes. Cataract may not be preventable, but it ranks very high in the causation of blindness in India; whether due to the effect of glare on a defective lens, want of vitamines, or other causes, it is perhaps the most important of all causes of blindness in India, and certainly responsible for much of the blindness of middle and old age in Indians, whilst glaucoma is also important.

If the above figure of 152 blind persons per 100,000 of the population of India be taken as representative, then there must be about 486,400 or nearly half a million blind persons in India. Of these cases probably one-half, possibly only one-third, are due to preventable causes. The problem of the prevention of blindness in India therefore resolves itself into the saving of the sight of some quarter of a million persons.

If this huge—and as yet but half understood—problem is to be solved, what are the steps which should be taken to face it? The first, second, third, and all-essential, is education and propaganda. We do not think that a month passes in which there is not an appeal in our columns for increased public health propaganda, whether with regard to mother- and child-welfare, medical, or even surgical matters. With regard to preventable blindness, this has also been recognised for years. India has produced many notable ophthalmic surgeons in the past: Henry Smith of Jullundur, Maynard of Calcutta, Herbert of Bombay, Elliot of Madras to name but four; and all were alive to the imperative necessity of organising some efficient means of combating preventable blindness in India.

Such propaganda can be suitably carried out by three chief agencies, the first the great ophthalmic hospitals and subsidiary ophthalmological centres under government control. Their efforts in this direction are not negligible. The Government Ophthalmic Hospital at Madras is one of the finest eye hospitals in the world, and is visited by ophthalmic surgeons from all parts. Colonel Wright considers that one of its chief functions ought to be that of a propaganda centre in connection with the prevention of blindness in the Presidency. He writes of an intensive educational propaganda for the public, of posters, lectures to educational bodies, to schoolmasters, of the necessity for travelling ophthalmic dispensaries somewhat on the lines of the itinerant ophthalmic dispensaries that have proved so successful in Egypt. The Madras Hospital, the fine new Eye Hospital in Calcutta, the Sir C. J. Ophthalmic Hospital in Bombay, and the other Government eye hospitals throughout the north, in some of which a vast amount of operative work is done, have an almost unlimited scope for such work. Major E. W. O'G. Kirwan, I.M.S., Superintendent of the new Eye Hospital in Calcutta, states in this connection. "It is largely a question of money. Calcutta has its new eye infirmary, but other large centres of population such as Mymensingh, etc., are without any organised ophthalmic clinic, unless the civil surgeon himself is an ophthalmic specialist. Now that Calcutta possesses a modern and efficient eye infirmary and teaching centre, I would suggest that an assistant surgeon trained in ophthalmology be sent gradually

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to each of the various large centres of population in Bengal. For a country like India, which has so much eye disease, an ophthalmic service as part of the public health service would be the ideal thing to aim at. Colonel Elliot once wrote that the real necessity was an official ophthalmic service, aided by private enterprise."

That men specially trained in ophthalmological work are being gradually established throughout the Madras Presidency, is shown by the most interesting map on page 38 of Colonel Wright's annual report for 1928. This shows the distribution of government ophthalmological departments connected with schools and colleges, of those connected with missions, of ophthalmologists with respectively more than, and less than, six months' training at the Madras Government Hospital, throughout the presidency. There are very few blank areas in this map, and trained assistance appears to be within fairly easy railway reach of all areas. The same, however, can as yet scarcely be true of Bengal or of the other parts of India.

Secondly, there is the very fine work carried out by certain missionary agencies, such as that of Dr. Holland at Shikarpur, Dr. McPhail of Bamdah, Dr. Kugelberg of Tirupathur and Dr. Vail of Miraj, to mention but four at different points of the compass out of a large number.

The third channel of relief is by the aid of voluntary associations. And here we have an excellent example in the Blind Relief Association of Sindh, several reports from which have reached us recently. This Association was founded in 1919 in the Ratnagiri district by Mr. C. G. Henderson, I.C.S., who collected funds locally, and was also helped by the Salvation Army. To-day the Association has several centres: Bijapur, Chalisgaon, Mirpur Khas, Anand, Palanpur, etc., and is carrying on a big work. At Bijapur in 1927 the number of eye operations amounted to 1,866, and of those attended to in out-patients to 19,452; at Chalisgaon in the same year there were 5,792 operations and 4,266 cases treated medicinally; at Anand 41 operations and 795 cases attended to otherwise; at Mirpur Khas 5,134 operations and 15,428 other attended to. The system is essentially one of employing touring specialist ophthalmic officers and covers the whole of lower Sindh. The cost is minimal, the organisation is run on voluntary lines and has to beg for subscriptions—though here and there a subsidised government assistant surgeon is lent; the attempt is to spread ophthalmic relief throughout the rural areas where it is most urgently wanted. All credit is due to this organisation which has now a fine record of ten years of most valuable work behind it.

In connection with voluntary agencies Major Kirwan, writes, "I should like it to be known that Mrs. Winifred Holt Matherm, the founder and secretary of the New York Association for the Blind, visited Calcutta last cold weather, with the object of starting a 'lighthouse' for the prevention of blindness in Bengal. She left a cheque for $500 with the American Consul General in Calcutta to help in the formation of an association for the prevention and relief of blindness. It is hoped that a start in the formation of such an association will be made as soon as possible."

An All-India Ophthalmological Society has recently been formed which we hope will interest itself in this important work—the prevention of blindness.

But, if we may be permitted a criticism, the relief of blindness and the operative treatment of cataract is not the whole solution of the prevention of blindness in India. What is wanted is some large organisation covering the whole of this sub-continent and aiming chiefly at prevention rather than treatment. In 1927 Colonel Elliot wrote as follows, "To me it seems that the duty and the privilege of undertaking this work lies with the State, and that no sum spent on such a task could be too large. Unfortunately this is not the view that has been taken by those in authority and consequently we see this spectacle of private enterprise endeavouring to undertake this colossal task..... It is at least permissible to voice an admiration for the stand taken by Mr. Henderson. The best that one can hope for his endeavour is that he will succeed in arousing the conscience of educated Indians to the needs of their less fortunate countrymen, and that this little cloud, no bigger than a man's hand, will end in a monsoon of active effort."

In this passage we cannot altogether subscribe to the criticism of government, for as we have seen government is doing a considerable amount through its well-found institutions. In brief what the position now calls for is an all-India movement. Overlapping should be prevented, and co-ordinated effort called for. It is recorded that in the Government Ophthalmic Department in Egypt, where the utmost efforts are put out, the percentage of blindness amongst patients attending dropped from 15 per cent. in 1909 to 9.8 per cent. in 1927, a fine memorial to Sir Ernest Cassell, who made it possible.

India can achieve like results. Obviously the main question is one of general public health. Public health is a transferred department, but if the Health Department of the Government of India interests itself in the matter in co-operation with missionary and voluntary movements, we do not despair of seeing an all-India organisation created and built up. Much interest and activity has recently been shown in this question of blindness and its prevention by the Health Department

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of the League of Nations, and by the organisers of the International Congress of Ophthalmology to be held in Amsterdam in September this year. It is hoped that much information and help may be derived from the deliberations of these bodies, which can be placed at the disposal of the Government of India through the Public Health Commissioner for application to the problem in this country.

To-day, however, the blind are innumerable all over India. They beg for alms at every street corner. How much of this is preventable, how much curable? We have not as yet statistics on which to base an answer, but the comparative figures for Great Britain and India assure us that preventable blindness is one of India's biggest future public health problems.

Medical News.

LEPROSY IN INDIA.

WE have received with much interest the first number of a new journal entitled *Leprosy in India*, to be published quarterly, edited by Dr. E. Muir of the Calcutta School of Tropical Medicine, and to be issued free to those concerned in active work in eliminating leprosy in India. The first issue was that for July, 1929, and the new journal is issued by the Indian Council of the British Empire Leprosy Relief Association. It is exceedingly well printed on paper of excellent quality, and will have an appeal to a wide circle of our readers.

Since the founding of the Indian Council in 1925 a new interest has been taken in leprosy in almost every province and state in India; hence the need for this new quarterly publication as a means of intercommunication between the many workers now actively concerned in the problem. The editor states that short original articles, news of various branches of the Association, notes of leprosy surveys in different tracts of India, and from leprosy clinics and leper institutions will be welcome for publication.

The issue for July, 1929, contains six chief items. After introductory general notes and an exposition of the objects of the Indian Council of the British Empire Leprosy Relief Association, four more or less clinical accounts complete the number, which contains 30 pages. Dr. I. Santra reports on a leprosy survey of Trivandrum *taluk* in Travancore. Here the statistics are most interesting; the incidence of leprosy being 61 per 100,000 on the coast, 48 per 100,000 inland, and 35 per 100,000 in the mountains. This survey is a very complete one, and an enormous amount of investigation has been carried out. Roughly speaking the incidence of leprosy is proportional to the local congestion of population. There are no less than seven special leprosy clinics at work in Travancore State, and conditions in the State are bad, the conditions which prevent the depressed classes from owing land permanently being a contributory factor. A separate leprosy department under the general Medical Board is suggested.

In the next article Dr. U. P. Gupta, M.B., D.T.M. (Bengal), gives an account of the history of anti-leprosy work in Bihar and Orissa. Here propaganda, survey, and treatment are the main lines of advance. Twelve centres are at work, in addition to clinics attached to the medical schools at Cuttack, Patna, and Darbhanga. An interesting point in this account is that not only are medical men sent for special training to the Leprosy Department of the Calcutta School of Tropical Medicine, but, as accommodation at that school is limited, training centres are being opened up in the *mofussil*.

Dr. P. M. C. Peacock deals with the skin clinic at Mandalay, which has now entered on its fifth year of existence. By treating cases of leprosy as out-patients, this clinic saves the cost of asylum treatment of many cases to government. A special feature of the clinic is the visiting of the homes of infected patients to enquire into the possible existence of other cases in the same house.

A review of recent leprosy work in the Philippine Islands by Dr. Rodriguez completes the number, and this will be of interest to all workers on leprosy in India.

Leprosy in India is a new departure, and a necessary one. It will give all workers on the subject in this country a common centre of information and a centre for the exchange of ideas. We foresee for it a large circulation and a considerable expansion of matter. The new journal is well edited and well printed; in time to come we look for a much larger journal and organisation. Malaria has not been so fortunate in India. It was once the subject of a special journal, named *Paludism*, which published seven numbers, as far as we remember, and then disappeared to be incorporated into the *Indian Journal of Medical Research*. The congestion in the latter journal, we understand, now renders the resurrection of *Paludism* advisable, if not essential. *Leprosy in India* will inform all especially interested in the subject with regard to leprosy surveys in India; but where are the malariologist and the malarial research worker to find information with regard to malaria in India? The answer is in locally published and departmental reports which have a most limited circulation and are usually not available.

We congratulate Dr. Muir on this new quarterly publication. He is not losing sight of the main issue, which is the publication of information, and the exchange of ideas among men interested in the same line of work.

THE OCTOBER 1928, SESSION OF THE OFFICE INTERNATIONALE d'HYGIENE PUBLIQUE.

WE have received through the courtesy of Colonel J. D. Graham, C.I.E., I.M.S., Public Health Commissioner with the Government of India, a copy of his interesting report of this session, held in Paris from the 15th to 24th of October of last year. It contains much of interest to readers in India. Colonel Graham attended as official delegate from the Government of India. Delegates were present from no less than 48 nations.

After the opening address by the President, M. Velghe (Belgium) and the presentation of official documents and reports, Dr. G. Abt was elected as Director of the Office and M. Marignac as Assistant Director and General Secretary. Different subjects and reports were then taken up in turn, and in several of them India figured prominently.

With regard to quarantine, information from all countries for the publication of an annual quarantine volume is still being collected. It was agreed that consular visas on deratisation were redundant and unnecessary. Information is also being collected with regard to the practice in different countries in appointing ships' doctors. A questionnaire is to be issued as to the relative value of different types of rat guards. Aircraft quarantine is a new and difficult problem; most world journeys by aeroplane are accomplished well within the limits of incubation of infectious diseases and the transference of infection from one country to another by aeroplane is a disturbing possibility. Dr. Lastuet gave an account of the system adopted in the Dakar-Morocco-France air line, and an Aviation Committee was appointed to go into the question.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It was announced that Australia has now brought her quarantine regulations into line with the new Convention. Major Thomson, President of the Maritime and Sanitary and Quarantine Board of Egypt presented a report on the sanitary regulations in connection with the Mecca pilgrimage of 1928. The meeting endorsed the necessity of appointing a Pilgrimage Committee as envisaged by the Treaty of Lausanne, and were of opinion that such a committee should be a permanent organisation. The committee should be an international one, with representatives on it of the different nations concerned. A local conference at Beyrout or Damascus to co-ordinate pilgrim traffic is also desirable, also the abolition of dhows for pilgrim traffic, and a uniform system of sanitary passports.

With regard to cholera, Colonel Graham reported that recent work had thrown considerable doubt on the supposed mutation of non-agglutinating strains into the true Koch's vibrio. Dr. d'Herelle has now become a professor at Yale University, but Dr. Asheshov, a distinguished pupil of his, is continuing his studies of the bacteriophage in India under the Indian Research Fund Association.

Papers on plague in the French colonies were next considered, and one read on plague in Mexico. Colonel Graham then presented reports by Dr. Goyle on rat fleas in the Punjab with reference to their importance as plague carriers, and a note on the resolutions with regard to plague come to by the recent 1927 Congress of the Far Eastern Association of Tropical Medicine in Calcutta. The question of plague in Russia and Mongolia was also discussed; in the latter area it is largely of pneumonic type.

The subject of yellow fever occupied much of the time of the session. Many communications were submitted, and the question of an epidemiological bureau for West Africa came up for consideration. The Conference recorded certain resolutions with regard to the recent research work on the disease, and it was pointed out that where the doctor is far away from a laboratory, the most important diagnostic feature of the disease is albuminuria with fever. A rapid and practical method of estimating albumin in the urine in such cases is badly wanted. The danger of the importation of yellow fever into India by aeroplane from West Africa also came up for consideration. Compulsory notification is more essential with regard to yellow fever than almost with regard to any other disease.

With regard to smallpox and vaccination discussion centred round post-vaccinal encephalitis, and recent research work was described. Sir George Buchanan gave a summary of the recent Ministry of Health report of the committee on vaccination, 1928. The subject of immunization with Calmette's B.C.G. against tuberculosis was discussed. The Roumanian report stated that the mortality was 0.9 per cent. in 1,000 immunised infants under one year of age, as against 25 per cent. in general in the same class born of tuberculous mothers. The report of the League of Nations Conference held at the Institut Pasteur, Paris (October 1928), was awaited. Sir George Buchanan then presented a paper on the present position in Great Britain with regard to encephalitis lethargica and its sequelæ.

Undulant fever next came up for consideration. (It is rather surprising to read that "it is possible that India has got this disease," for we thought that it had long ago been established that it was endemic in the Punjab.) In India, however, the universal custom of boiling milk is an effective safeguard. Dengue in Greece was then discussed, and afterwards Colonel Graham spoke on the present position with regard to the kala-azar transmission problem in India.

Colonel S. P. James, I.M.S. (Retd.), described the methods adopted in Great Britain of treating cases of tabes and general paralysis with malaria induced by the bites of infected mosquitoes; it is proposed to try the effect of induced quartan malaria, as well as of benign tertian infection. Dr. Clark (United States) described methyl alcohol poisoning in America.

A sub-commission was appointed to go into the question of modern hospitals and their construction. Problems in relation to social hygiene and maternity and child-welfare were also discussed.

Among the other reports presented by Colonel Graham at the session were a note on the decrease of plague in Burma by Colonel Bissett, Director of Public Health, Burma; notes on quinquennial outbreaks of smallpox by Dr. C. Bentley, Director of Public Health, Bengal; and a note on India's present arrangements for treating venereal diseases. The Indian contributions were well received, and special interest aroused with regard to the papers dealing with plague, cholera and bacteriophage.

THE INDIAN SCIENCE CONGRESS, 1930.

THE Indian Science Congress, 1930, is to be held at Allahabad in the first week of January, 1930. The President of the Medical and Veterinary Research Section is Lieut.-Colonel R. Knowles, I.M.S.

In view of the fact that an excessive number of papers have been received in past years which has made it impossible for all the papers to be read in the time available, and necessitated the curtailment of discussion on other papers, it is unfortunately necessary to exercise a strict selection. Authors are therefore requested to take note of the following points:—

(*i*) Papers *must* be received by the Sectional President (Lieut.-Colonel R. Knowles, I.M.S., Calcutta School of Tropical Medicine) not later than the 15th October, 1929. *Papers received at a later date simply cannot be accepted.*

(*ii*) Only original papers, that is to say papers which have not already been read or published in the same or similar form, will be accepted. Not more than two papers will be accepted from any one contributor.

(*iii*) Papers will not be accepted from individuals who have not paid their subscription. (The General Secretary has asked us to bring this matter particularly to the notice of our readers.)

(*iv*) Papers must be sufficiently short to be read in 20 minutes. It takes 3 minutes to read a page of foolscap intelligibly, apart from diagrams, slides, etc. Papers should not, therefore, exceed 7 pages of typed foolscap.

(*v*) Papers *must* be accompanied by 3 typed copies of an abstract of the paper. This abstract must not exceed 200 words, and should not contain any formulæ or diagrams. *Papers not accompanied by such abstracts will not be accepted.* (It is not fair on members of the Congress not to have due notice from the programme of what the paper is about.)

(*vi*) All diagrams, tables, pictures, etc., should be reduced to lantern slides, or enlarged to posters corresponding in type to 6-18 Snellen.

(*vii*) Authors should not contribute accounts of their papers to the local lay press. (It is hoped that it will be possible to arrange for a daily précis of the proceedings in the Medical and Veterinary Section to be sent to the press officially by the President of the Section.)

Will our readers kindly take this notification as the second official intimation with regard to the 1930 Congress? We trust, further, that the members of the medical and veterinary professions in Allahabad will co-operate to make the 1930 Congress a successful one.

There are three classes of members of the Indian Science Congress; viz:—

(*i*) Full members; annual subscription, Rs. 10.
(*ii*) Associate members; annual subscription, Rs. 5.
(*iii*) Student members (who must be certified by the principal of their college to be such), Rs. 2.

Only full members have the right to read papers; associate and student members may submit papers through a full member. Subscriptions should be paid to the Honorary Treasurer, Indian Science Congress, c/o the Asiatic Society of Bengal, 1, Park Street, Calcutta.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THE EXTENSION OF THE BAI YAMUNABAI L. NAIR HOSPITAL, BOMBAY.

WE have received from a correspondent an account, taken from the *Times of India* of the 20th March, 1929, of the laying of the foundation stone of the new extension to the Bai Yamunabai L. Nair Hospital, Bombay, by His Excellency the Governor of Bombay. This hospital is a remarkable one in that it was erected and is run by the generosity of a private individual, Dr. A. L. Nair of Messrs. N. Powell and Co., Bombay. We can only wish that other philanthropists in India would follow his admirable lead.

The following are abstracts from the account:--

His Excellency the Governor and Lady Sykes attended on Tuesday afternoon the foundation laying ceremony of an extension to the Bai Yamunabai L. Nair Hospital, an institution highly deserving of sympathy and support from Government and the public of Bombay. The hospital and its annexe, the National Medical College, were the objects of praise in all the speeches delivered on the occasion, including that of the Governor, for the noble work they were doing in the cause of medical education and medical relief among the poor. The most noteworthy feature of both these sister institutions is that, as more than one speaker pointed out, their financial responsibility has to a very large extent been shouldered by a philanthropist who is not a millionaire and who has borne the burden out of his hard-earned money. Another equally unique feature is that they are conducted by medical men of high attainments working entirely in an honorary capacity and at considerable self-sacrifice. While paying tributes to the generosity of the donor and the self-sacrificing zeal of the honorary workers, both His Excellency and others who took part in the proceedings stressed the urgent need of financial help to the institution from the generous and charitably inclined public.

In the course of his speech requesting His Excellency to lay the foundation stone of the hospital extension, Mr. M. Venkatrao, Chairman of the Executive Committee, said the hospital owed its existence to the munificence of Dr. A. L. Nair of Messrs. N. Powell and Company. With a view to insuring the efficient and speedy realisation of the object of the charity, the sympathy and support of prominent medical men of the city were obtained and their active co-operation in the working of the hospital was secured. These men had, since its inception, managed the hospital with commendable zeal and enthusiasm and had rendered service throughout without remuneration.

The other institution with which the hospital was inseparably connected, continued Mr. Venkatrao, was the National Medical College. Since 1927 the hospital was being managed by the Council of Management of this College through the Hospital Executive Committee.

Turning to the work of the hospital, the speaker emphasised the value of such a charitable general hospital in that thickly populated locality. The institution became very popular from the start and the management had to request the donor to increase the indoor accommodation which he generously did, increasing the number of beds to 62. During the recent riots in the city the hospital treated quite a large number of indoor patients, the majority of whom were Mahomedans and Pathans. As regards out-patients, being a free hospital intended for the poor, their number was ever on the increase, the figure reached in 1928 being 42,982.

The problem of finding accommodation to meet the increasing demand led the Committee to make one more call on Dr. Nair's unfailing benevolence and he agreed to bear the expenses of the extension, estimated at Rs. 1,14,839 exclusive of equipment. Mr. Venkatrao, in conclusion, made a strong plea for public sympathy and support, pointing out that the work of medical relief and medical education was difficult of achievement by the unaided efforts of a single individual. The hospital had been singularly unfortunate in not receiving from Government any help, in spite of repeated applications. Similarly, the National Medical College had been unfortunate in not receiving a permanent grant. In the final year medical examination of 1926 a student of the National Medical College stood first among the successful candidates and in the year 1928 the first three students among the successful students of the Presidency belonged to the same College.

His Excellency the Governor, after laying the foundation stone addressed the gathering. He said: "We have heard so much from many different sources of the good work that is being done by the National Medical College and the Bai Yamunabai Nair Charitable Hospital, that Lady Sykes and I are both very pleased to come here and see for ourselves how both these institutions are managed, and to meet those who are engaged in work of such an important character, and so beneficial especially to the poorer classes of this part of Bombay. Of the necessity for medical relief on an ever-increasing scale there can, I think, be no doubt in the mind of anyone who has studied the conditions here. It is unfortunately true that practically every large city of the world can show an equally unsatisfactory state of affairs, but of the existence of these conditions in Bombay we are all too painfully aware, and I should be only too glad to do anything I can to assist any institution, whether official or non-official, that is working for the relief from the effects of disease of the citizens of Bombay, and especially of the poorer classes.

"I have been much interested to hear of the growth of this Medical College and Hospital, purely as the result of the voluntary effort on the part of many, and in particular due to the generosity of Dr. Nair. It is indeed, as has been said before, a record of hard work, generosity and self-sacrifice, which deserves the encouragement and the assistance of all who are able to contribute to such philanthropic schemes.

"The extension of the hospital building, the foundation stone of which I have just laid, will certainly add greatly to the usefulness of the hospital. The figures of the number of out-patients treated in recent years are most striking. They show that the hospital has secured the confidence of the population of this locality, and with the additional facilities which this new building will provide, we may expect the numbers to go on increasing even more rapidly. The very generous donation which Dr. Nair has given for this new building will afford an excellent example to some future benefactor, and I hope that when that time comes you will invite me here again to inaugurate whatever improvement or extension you may be able to undertake.

"There is one matter in which I fear I must give you a somewhat disappointing reply, and that is in regard to the proposed grant-in-aid to the college or to the hospital, or both. With regard to the hospital, I think it is well known that Government have lately undertaken, with the help of the Hospital Fund, very large extensions of the J. J. Hospital group, which will involve them in greatly increased annual expenditure, although, as is well known, the responsibility for any extension of medical relief actually rests on the Corporation. I am afraid that the days of benevolent autocracy are past, and that, in the democratic present, any question of financial assistance has to be considered officially by Government according to very well-defined rules, and, in the case of medical institutions, on the advice of the Minister-in-charge of the subject. I do not think I am giving away a state secret when I say that we did try to make a provision for assistance to the College in the budget for the next year, but, owing to our other very heavy commitments to which I have referred, it was not possible to retain this provision in the budget as finally framed and passed quite recently by the Legislative Council. This does not mean that Government are not sincerely appreciative of the excellent work that is being done in the College, but simply that the proposal, like many other excellent proposals, has had to be omitted for want of funds."

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SPECIAL ARTICLE.

THE VITAL CAPACITY OF THE LUNGS.*

By S. L. BHATIA, M.C., M.A., M.D. (Cantab.), M.R.C.P. (Lond.),
MAJOR, I.M.S.,
Professor of Physiology and Dean, Grant Medical College, Bombay.

It is since the publication of the classical work of John Hutchinson in 1846 that the subject of estimating the amount of air respired has been placed on a scientific basis. It was he who first used the term "vital capacity of the lungs," which means the amount of air which can be forcibly expelled from the lungs after the deepest possible inspiration. His studies included observations on 3,000 people, some healthy, others suffering from pulmonary disease. He concluded that in any individual case, the vital capacity of the lungs was a constant quantity, and that it varied according to height, weight, age and disease. He also observed that it had a close relationship to the height of the individual.

Since Hutchinson's time, numerous observers have taken up this subject. Gustav Simon (1848), Fabius (1853), Wintrich (1854), Schneevogl (1854), Müller (1868), Waldenburg (1880), George Cornet (1884), Rubow (1908), Siebeck (1910), Plesch (1913), and others have made important contributions. It was, however, during the Great War, that this subject received a special stimulus. A large number of men were needed for the fighting forces. Georges Dreyer's work was here very valuable in assessing the physical fitness of recruits. He estimated the vital capacity of the lungs as a routine measure in the examination of candidates for the Royal Air Force. Says Dreyer, "A definite minimum standard of vital capacity was fixed more or less arbitrarily for the admission of cadets to the Royal Air Force, and standards were also decided upon for the grading of flying officers for different types of service. In laying down rules in this connection, the question of the size of the man was entirely disregarded as though of no consequence, and the standards were arrived at simply as the result of examining a number of successful pilots and determining the average vital capacity." This led Dreyer to investigate the subject further and stimulated others to do the same. In recent years, Peabody and Wentworth, West and others have made many valuable additions to our knowledge of this subject.

The vital capacity of the lungs is measured by means of a spirometer, an instrument which was originally invented by Hutchinson. The subject takes the deepest possible inspiration, and then breathes out into the instrument. The quantity of air breathed out by the deepest possible expiration is a measure of the vital capacity of the lungs.

It is the sum total of :—

(*a*) *Tidal air:* the amount of air breathed out in a normal quiet expiration.

(*b*) *Complemental air:* the quantity of air, which can be drawn forcibly into the lungs, over and above that inhaled in ordinary inspiration.

(*c*) *Supplemental air:* the quantity of air which can be expelled forcibly from the lungs, over and above that expelled after ordinary expiration.

The average vital capacity in adult men is about 3,500 c.c. It is about seven times as great as the normal sized breath, and may be regarded as the deepest breath one can take. It varies to a certain extent with the physical training of the individual. Athletes, men engaged in hard manual work, those who play on wind instruments, or have trained their voice for singing give higher figures.

Occupation seems to influence it markedly. Dreyer grouped all people into three classes: A, B and C:—

Class A = Men in the Army and Navy, policemen, athletes, university students playing games, firemen, blacksmiths, boiler-makers.

Class B = Professional men, doctors, lawyers, business men, railway men, clerks of higher grade, etc.

Class C = Tailors, shopmen, shoe-makers, printers, potters, painters, clerks of lower grade, etc.

It is to be pointed out that there are marked individual variations in the vital capacity, and it cannot be said that all men belonging to say Class A have a higher vital capacity than all men in Class B. Further, individuals who play games and spend a lot of time in the open air may be put in Class A irrespective of their occupation.

There are definite differences between the vital capacity of men and women. Men have a higher vital capacity, the difference amounting to 600 to 700 c.c. The vital capacity of boys is about 6 per cent. greater than that of girls. This sex variation in vital capacity persists up to the most advanced age.

Age markedly influences the vital capacity. In children it differs considerably from that in adults, so much so that separate standards for children have been worked out. At the age of 5 years, the average vital capacity is 837 c.c.; at the age of 10, 1,525 c.c.; at the age of 15, 2,400 c.c. At the age of 19 it approaches the adult figure of 3,500 c.c. or over. There are variations of course in children according to height as in adults. It is said that the maximum vital capacity is found at about the 30th year. In old age there is an appreciable decrease.

Obesity as well as under-nutrition cause a reduction in the vital capacity figures. It is also affected by *posture*. Thus it has been shown by Christie and Beams, that the vital capacity of a person in the reclining position is on the average 5.5 per cent. lower than when he is sitting up. This is an important observation, for it is often necessary in clinical work to measure the vital capacity of patients lying in bed. It is then useful to know that a part of the reduction in vital capacity is due to the recumbent position.

Race seems to have a definite influence on vital capacity. This has been observed by Dreyer, Wilson, Edwards, Foster and Hsieh. The last two observers studied the vital capacity of 500 Chinese in several occupations, including women, and concluded that "the Chinese show much lower vital capacity ratios than Westerners." Myers, working on small groups of Chinese and Filipinos, has found lower vital capacity figures in them than amongst the white race.

This existence of a possible racial factor led me to take up this subject. The object of this investigation, which is still in progress, is to ascertain normal standards for vital capacity in Indians, and to see how far they differ from the standards given for Western people. Altogether 100 normal subjects, all males, have so far been examined. They were mostly medical students, but a few medical men and some laboratory servants have also been included. The great majority of them were between 20 and 45 years of age. For vital capacity measurements, three trials were made by each person with the spirometer, and the highest of the three was recorded as the vital capacity. The age, standing height, sitting (or stem) height, body weight, and chest circumference were also recorded. The sitting or stem height was measured from the sacrum to the top of the head while the subject was sitting up against a vertical graduated bar. The chest circumference was measured, as recommended by Parmenter and Gray, at the level of the xiphoid process. One measurement was taken on deep inspiration and another on deep expiration. The average of the two readings was used for comparison with standard tables. The surface area of the body was obtained from the body weight and standing height. The graphic chart of Boothby and Sandiford based on the formulæ of Dubois and Dubois was used. Further, in addition to the *actual* body weight, the theoretical normal body weight was also recorded. This was obtained from the tables of standard weights according to height and age as worked out by the Association of Life

*Being a paper read at the Medical and Veterinary Section of the Indian Science Congress, Madras, January, 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Assurance Medical Directors and Actuarial Society of America.

Theoretical normal standards for vital capacity have been worked out on the basis of the standing height, body weight, body surface area, sitting or stem height, and chest circumference. It is now generally admitted that the standards according to body surface area and standing height are most constant, and therefore most reliable. In my observations, however, I compared the actual figures for vital capacity obtained in each individual with the normal theoretical standards, as given by Myers, according to *all* the different factors mentioned above, namely, standing height, body weight, body surface area, sitting height and chest circumference. In this way, one tried to find out what percentage of the normal theoretical vital capacity the actual figures obtained in each case represent.

The results showed that there is a close similarity between the percentages obtained from the standing height and surface area standards. This is as was to be expected. The other three standards, namely, sitting height, body weight and chest circumference showed marked variations. But no matter what standard is taken into consideration, one fact is perfectly obvious, namely, that the vital capacity of the lungs of this group of 100 Indians is much smaller than the normal standards given for Western people. A great majority of them have vital capacities between 70 and 90 per cent. of the normal, and the proportion of those with figures above 100 per cent. is very small, amounting to only 2 or 3 per cent., if reckoned according to the surface area or the standing height standards respectively.

Taking into consideration all the observations on these 100 normal subjects, it would appear that the average vital capacity of Indians is lower than that of Europeans, both in the total volume and in proportion to the body surface area. While the average vital capacity of Europeans is 3,500 cubic centimetres or over* and 2,500 cubic centimetres per square metre of body surface area, for Indians the figures are about 3,091 c.c. and 1,960 c.c., respectively.

The actual body weight of a large majority of these men was much below the theoretical normal standards as laid down for the Western people by the Association of Life Insurance Medical Directors and Actuarial Society of America.

The figures for vital capacity obtained by me correspond to a certain extent with those obtained by Foster and Hsieh for the Chinese.

A comparison of these figures for Americans, Chinese and Indians is given in the following table:—

	Vital capacity, per square metre body surface.	Vital capacity, height per centimetre.
Americans—Men	2.5 litres.	25.0 c.c.
Chinese—Men ..	2.0 litres.	19.0 c.c.
Indians—Men ..	1.96 litres.	18.52 c.c.

This clearly shows that there is a racial factor which markedly influences the vital capacity, and that it is definitely lower in the Indian and Chinese than in the Western people. There is a great need for further investigation. Normal standards for Indians should be worked out carefully, for the existing European and American standards are not applicable to us. Apart from its physiological importance, the subject is of great clinical significance.

Some of the applications of the vital capacity test in clinical medicine and surgery may be mentioned.

The vital capacity is reduced in the following conditions:—

(1) In a majority of persons suffering from old pleural adhesions resulting from pleurisy, pneumonia and empyema.

(2) In certain old standing deformities of the thorax and ossification of the costal cartilages and costo-vertebral joints.

(3) In disturbed functions of the intercostal muscles. In paralysis of the diaphragm, or interference in its action owing to great abdominal distension, especially of acute onset.

(4) In cardiac disease. This aspect of the question has been extensively studied in recent years. According to Levison, the vital capacity of cardiac patients runs roughly parallel to their dyspnœa. The reduction of vital capacity in cardiac disease is an important clue to prognosis, for it is said that the greater the reduction, the worse the prognosis. During failure of compensation in heart disease, the vital capacity is much diminished, but it increases as compensation is established. The test is also a valuable guide to treatment. It is an index of cardiac tolerance and has a close relationship with exercise tolerance in any given case.

(5) In hyperthyroidism. Here it corresponds with the tendency to dyspnœa. Robinowitch reports some cases showing that decreased vital capacity has a close relationship with increased basal metabolism in hyperthyroidism. It is believed that this reduction in vital capacity is due to cardiac involvement, and the greater the reduction the poorer the prognosis.

(6) In bronchial asthma, emphysema, bronchitis and pleurisy. Also in pneumothorax, both spontaneous and artificial, and hydrothorax.

(7) In pulmonary abscess, bronchiectasis and new growths in the thorax.

(8) In pneumonia *par excellence*. According to Myers there is no acute disease of the lungs which so reduces the vital capacity from the commencement of the illness as pneumonia. The reduction is maximum about the time of the crisis. Then with convalescence it steadily rises. If however any complications occur, e.g., abscess or empyema, this increase does not take place. Thus the test affords valuable evidence of the progress in this disease.

(9) In pulmonary tuberculosis. Hutchinson originally introduced the test as an aid in the diagnosis of pulmonary tuberculosis. From the very commencement of the illness there is a steady reduction in vital capacity. As the condition improves, vital capacity also increases. It is a valuable guide to treatment and prognosis. This test is largely employed in this disease and its value is well established. The work of Burrell and Dreyer in this connection is of special interest.

(10) Extensive thoracoplastic operations produce a marked reduction in the vital capacity. Hence it is necessary that before such an operation is attempted, the vital capacity should be measured. If it be already very low, only minimal surgery should be resorted to. Such a precaution is necessary before an open drainage is established for empyema, or a thoracoplastic operation performed for pulmonary tuberculosis. In carrying out artificial pneumothorax also for pulmonary tuberculosis, it is advisable to know the vital capacity beforehand, for if low, only a small quantity of air should be introduced into the pleural cavity.

These are some of the pathological conditions in which this test is serviceable. When taken together with history, clinical findings, *x*-rays and other aids to diagnosis, there is no doubt that it affords valuable help in judging the severity of the condition as well as the course and ultimate outlook of the case. As a test of physiological fitness in healthy people, it is useful chiefly in so far as the condition of heart and lungs is concerned.

* Halliburton gives the vital capacity for the European as 3,500 to 4,000 cubic centimetres. If the figure be taken as 3,750 c.c. and the capacity per square metre as 2,500 c.c. (Major Bhatia's figure), then the average body surface area would be 1.5 square metres. But according to Major Bhatia's figures the average body surface area of Indians is 1.577 square metres, or greater than that of the European. This is, however, not a fact.—ED., *I. M. G.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The test should be employed oftener than it is at present. But it is obvious that it can be helpful only if there are reliable normal standards to go by. The existing standards for Europeans and Americans will not do for Indians. It is necessary that we should work out the normal standards for the inhabitants of this country. The study of 100 normal subjects described here is an attempt in that direction.

REFERENCE.

J. A. Myers (1925). *Vital Capacity of the Lungs.*

Current Topics.

Some Modern Aspects of Nephritis.

By W. LANGDON BROWN, M.A., M.D., F.R.C.P.

(Abstracted from *The Brit. Med. Journ.*, May 4th, 1929, p. 797.)

I SHALL adopt the following classification of nephritis, slightly modified from Aschoff :—

(1) Degenerative Group.

(*a*) Acute. *Toxæmic Kidney*—such as that produced by drugs (for example, corrosive sublimate and carbolic acid) or by the toxæmias of pregnancy.

(*b*) Chronic. *Amyloid Kidney.*

(2) Inflammatory Group.

(*a*) *Glomerulo-tubular.*

(*i*) Acute—ordinary acute nephritis.

(*ii*) Subacute—chronic parenchymatous nephritis; large white kidney.

(*iii*) Chronic—chronic mixed nephritis or contracting kidney.

It must be recognized that these may either follow one another in this order, or (*ii*) and (*iii*) may apparently arise independently of (*i*).

(*b*) *Focal Emboli Nephritis*—as seen in infective endocarditis, when the nephritis is set up by multiple emboli from the heart valves.

(*c*) *Chronic Interstitial Nephritis*—the small red or granular kidney.

(3) Vascular Group.

(*a*) *Hyperpietic.*

(*b*) *Senile or Athermatous.*

To my mind the position has only been made more difficult and obscured by Volhard's introduction of the term "nephrosis," which has by some writers been so extended as to include chronic parenchymatous nephritis. I consider this term should be limited to toxæmic kidney in which there are merely degenerative changes in the tubules without any inflammatory reaction. There is marked œdema, excess of cholesterol in the blood, and massive albuminuria, but there are no cardio-vascular changes or casts. The urea of the blood remains normal, as does the globulin, but its albumin content falls as the disease progresses. Nephrosis is part of a general toxæmia, and some observers claim that when it is experimentally produced the first protein to appear in the urine may be hepatic in origin. At the necropsy a large amount of cholesterol may be found in the kidney tubules, the so-called "myelin" kidneys. Death or complete recovery is the rule, but occasionally a toxæmic kidney may lead to chronic nephritis.

Of late the tendency has been towards a secretory rather than an anatomical classification. This is really an advantage since the anatomical basis can only be established after death when the opportunity for treatment is past.

Broadly speaking, the kidney may excrete two classes of substances: (1) those which can be of use to the body—water, salt, sugar, bile, hæmoglobin; (2) those which are purely waste products—urea and allied nitrogenous substances. Against the excretion of the first group the kidney presents a threshold; it does not attempt to excrete them until their concentration in the blood reaches a certain height, for it would not do for such substances to be drained out of the body. For the second group no such barrier is needed. The secretory classification is as follows :—

(1) *Hydræmic Nephritis* (which broadly corresponds to chronic parenchymatous nephritis).—Here the excretion of Class 1 is involved, particularly of water and salt. The output of urea may be normal, and there will not be any retention of it in the blood. Not so with chlorides, the content of which in the blood will be raised. Œdema may be very marked, but there will be little evidence of cardio-vascular change.

(2) *Azotæmic Nephritis.*—Here there is gross failure of the concentrating power of the kidney, and since the great work of the kidney in concentration is in relation to nitrogenous waste products, and as urea is the most abundant of these, we find not only a fall of urea in the urine, but a rise of it in the blood. There is a rise from the normal 20 to 40 mg. per cent. to 80, 100, or much more in severe cases. The cardio-vascular changes tend to be very marked.

(3) *Mixed Types.*—As interstitial changes, which are chiefly associated with azotæmia, proceed more slowly than the parenchymatous, which are chiefly associated with hydræmia, the former gradually alter the picture. A chronic parenchymatous nephritic either dies of intercurrent infections or passes into the contracted stage with interstitial changes; the œdema subsides, the blood pressure goes up, and the heart hypertrophies. Both sodium chloride and urea are retained in the blood. If there is both nitrogenous retention and renal œdema, the case must be a mixed one.

I shall next consider some clincial features and the treatment of three leading types of nephritis—the acute, the hydræmic, and the azotæmic.

ACUTE NEPHRITIS.

It is important to treat the cause of acute nephritis as soon as possible. The principal causes are :—

(1) *Acute Specific Fevers, such as Scarlet Fever.*—Recent observations show the great value of the administration of alkalis in scarlet fever as a prophylactic measure against the complication of acute nephritis.

(2) *Diseases of the Respiratory Tract.*—This applies particularly to the upper respiratory tract, especially the tonsils. I recently had a case of acute hæmorrhagic nephritis associated with an infected antrum, drainage of which was followed by rapid improvement. But Sir Thomas Horder has also called attention to the importance of extended sepsis as well as of focal sepsis. Thus a widespread infection of the bronchial tubes can lead to troubles similar to those due to a small collection of pent-up pus. This is particularly well seen in hyperpiesis and nephritis.

(3) *Diseases of the Skin.*—Since the skin is a part of the excretory apparatus, the association between diseases of the skin and of the kidney is not surprising. Extensive burns are well known to cause acute nephritis, though here extended sepsis is probably the chief factor. I have recently had two cases of scabies causing a staphylococcal infection of the skin, which were followed by acute nephritis. Here ultra-violet rays helped to clear up the skin very quickly, and the nephritis rapidly improved when this was achieved.

(4) *Purpura.*—Here presumably the purpura and the acute nephritis are both consequences of a common cause, but it is not infrequent for the nephritis to occur later than the purpura.

(5) *Epidemic Type.*—This is the type encountered during the war, of which I have written elsewhere. It is sufficient here to point out that dyspnœa was an early symptom, and that Shaw Dunn found multiple thromboses in the lungs. So perhaps this is really a special instance of (2), though presumably due to some unknown specific infection. According to Aschoff the renal lesion is a pure glomerulitis.

In the treatment of acute nephritis, I am strongly of opinion that the conventional milk diet is a mistake in the earliest stages. Far better results accrue from von Noorden's plan of giving nothing but fruit, fruit juice, sugar, and water. If there is much hunger, I generally allow toffee as well. The question of diuretics

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

will be dealt with under hydræmic nephritis. Later on, milk can be given and the conventional treatment followed. Sufficient alkalis to render the urine alkaline seems a wise measure, and it is well to keep the patient in bed until the centrifugalized urine shows no red blood corpuscles on microscopic examination.

HYDRÆMIC NEPHRITIS.

There has been much controversy as to the cause of the dropsy which is the outstanding feature of this type. Widal attributed it to the retention of sodium chloride, but the results of a salt-free diet have been disappointing. Moreover, as Izod Bennett points out, "the same kidneys which at first secreted a urine poor in chlorides will, a week later, when œdema is subsiding, secrete a urine containing abundant chlorides." In other words, if water is retained, salt must also be retained. But I do not agree with Bennett when he says that an increase in the blood chlorides has never been demonstrated in this condition. Thus, in a recent case of mine, the blood chlorides were 580 mg. per cent., as against the normal 360 mg., and the urinary chlorides 150 mg. per cent., instead of 500 mg. I think that while retention of chlorides has been overstressed in the past, it may be a factor in renal œdema.

Epstein's explanation of renal œdema involves two main factors: (*a*) there is a serious drainage of blood proteins into the urine, which may mean that as much as 10 per cent. of these proteins are lost daily. In this way there is a fall in the osmotic pressure of the blood, with consequent retention of water in the tissues. Subsequent investigations on the osmotic pressure of proteins have supported this conclusion. (*b*) In hydræmic nephritis the lipoids, especially cholesterol, accumulate in the blood and tissue fluids, which he believes increases the tendency to œdema.

A recent case of mine showed a cholesterol content of 390 mg., falling to 250 mg. as the œdema subsided, whereas the normal lies between 100 and 190 mg. Bright himself called attention to the milkiness of the plasma and body fluids in nephritis with dropsy, and J. Maxwell has recently devoted attention to the subject. He showed that the cholesterol of the plasma is almost invariably increased in every type of renal œdema, and though not necessarily proportional to the amount of œdema its presence in increased amounts is prognostic of a chronic course. He did not think, however, that the cholesterolæmia and the œdema were related as cause and effect, but rather that both are the results of some toxic action on the tissues.

Epstein advised a high protein diet and very little fat in such cases. It is true that a high protein diet may sometimes greatly reduce œdema in hydræmic nephritis, but in part this is due to urea, the natural diuretic, which must be formed in large amounts from the amino-acids into which that protein excess disintegrates during digestion and before it is absorbed.

In passing, why forbid eggs in albuminuria, as is so often done? Now that we know how completely protein is disintegrated before it is absorbed, how can it "run through" from the bowel to the kidney?

Again, raw eggs may cause a slight toxic albuminuria in those sensitive to them, but this does not occur after cooked eggs. I have deliberately added eggs to the diet of patients with hydræmic nephritis, and have found no increase in the albuminuria produced thereby.

It naturally follows that the high protein diet is only applicable when it is certain that there is no urea retention. Mere estimation of the percentage of urea in the urine seems to be of little value, since so much of the urea is exogenous, coming directly from the disintegration of food proteins. Many patients with nephritis are already on a low nitrogenous diet, which will necessarily lower the percentage of urea in the urine. MacLean's urea concentration test is, however, of considerable value, since it shows whether, given a definite amount of urea to deal with, the kidney is capable of doing adequate work. I have often found that though the blood urea is normal, the urea concentration test gives too low a figure. This presumably means that the kidney can only just get along on its low protein diet, and that urea retention is just beginning. Such cases are not suitable for Epstein's treatment. There seems little justification for his embargo on fats, since it is only cholesterol that is concerned, and that probably not in causal relationship. Moreover, Epstein is not consistent in this, since he allows eggs, which contain cholesterol in fair amount.

It would appear, then, that Epstein's method is only of limited application to cases of hydræmic nephritis proved to be free from nitrogen retention. Then a high protein diet may help to make good the excessive protein loss, while diuresis may be assisted by giving urea as such in doses of 40 to 60 grains three times a day. It is entirely non-toxic. Some thirty years ago it was given in large doses in tuberculosis. I doubt if it ever did any good for that disease, but it certainly did no harm, so that one need feel no scruples about using it in the type of case here described.

This brings me to the subject of diuretics in nephritis. They may act—

(1) *By producing vaso-dilatation in the kidney.*—The caffeine group act in this way. They probably act as direct stimulants to the renal epithelium, the vascular change being secondary.

(2) *By increasing the cardiac efficiency.*—The digitalis group apparently act as diuretics in this way.

(3) *By increasing the quantity of circulating fluid:* (*a*) by absorption of water from the intestines, as by giving the patient large quantities of water to drink; (*b*) by increasing the osmotic pressure of the blood. The saline diuretics and urea itself act in this way, attracting water from the tissues into the blood stream.

How far are these methods applicable to hydræmic nephritis? The first breaks the physiological law of resting damaged structures; I believe all the stimulating diuretics are capable of doing harm in this disease. The second is presumably only helpful when there is cardiac insufficiency as well. The third can do no harm, and may do good.

A study of the ætiology of renal œdema leaves us with the impression that it is "at once suggestive of pathological changes in tissues other than the kidney" (Bennett). This is the idea underlying the use of novasurol and euphylin as diuretics in nephritis, since they are believed to act on the tissues, enabling them to give up the water they are retaining. It is necessary to raise the hydrogen-ion concentration of the blood first by giving 1 to 2 drachms of ammonium chloride on each of two days, and then on the third day injecting ½ to 1 c.cm. of novasurol intramuscularly. Both parts of this treatment are usually repeated after a few days' interval. Some give larger doses of ammonium chloride and over a longer period. This plan may be adopted in obstinate cases, but it often fails. In acute nephritis I believe that 3 (*b*) is the only method that should be tried unless there is cardiac insufficiency as well, in which case digitalis may also be given.

Elimination by the skin as an alternative route of excretion has long been a common practice in nephritis. It is open to the following objections.

(*a*) Only 3 grams of nitrogen can be got rid of through the skin in the day, compared with 8 grams which can be more easily eliminated by the bowel.

(*b*) Physiological rest for the kidney is not secured by giving it a highly concentrated urine to deal with.

(*c*) Diaphoresis is an exhausting process, and may depress the heart.

(*d*) The withdrawal of so much fluid without a corresponding removal of organic solids must increase the concentration of the toxins in the circulation.

It has been argued in support of this method of treatment that after a hot-air bath the patient may be actually covered with small crystals. These are, however, chiefly crystals of sodium chloride, though there may be some urea as well. Herein we have a clue to the type of case in which diaphoresis will be of service, namely, the one when there is salt retention as a factor in the œdema, as explained above. The elimination of salt may then be of indirect service by breaking a vicious circle. In cases of this sort I have actually seen diaphoresis followed by diuresis, which can only be explained in this

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

way. I conclude that the hot-air bath is only suitable when dropsy is actually present. Another indication that the treatment is having a good effect is the occurrence of sweating at a lower temperature than the one originally required to evoke it.

Decapsulation was revived a few years ago as a method of treatment in chronic parenchymatous nephritis by Sir Thomas Horder. It had previously been advocated chiefly for chronic interstitial nephritis, and finally abandoned for this condition. In cases of parenchymatous nephritis, the following have been considered to be indications for this procedure:—

(1) Persistence of the œdema for three months in spite of careful medical treatment.

(2) Absence of urea retention.

(3) Absence of cardio-vascular changes.

But even when all these indications are fulfilled the results are often unsatisfactory, and I cannot recommend this operation.

AZOTÆMIC NEPHRITIS.

When there is reason to believe that nitrogen retention is occurring the interpolation of two days of von Noorden's fruit juice and sugar diet, as mentioned under acute nephritis, may be of great benefit. I look upon this plan as comparable in value with the vegetable and egg diet in the treatment of diabetes in the pre-insulin days. After this a diet containing a restricted amount of protein should be given, and one which contains as little extractives as possible, since these give work to the kidney without providing a corresponding amount of nourishment. It is possible for an adult to maintain nitrogenous equilibrium on 1 gram per kilogram of body weight, and for a time less than this will suffice if there is nitrogen retention. This means that a man of 10 st. requires 66 grains of protein. During the epidemic of war nephritis I drew up the following two diets, the low nitrogen diet being given for the first week and the moderate nitrogen diet for the second and subsequent weeks as required.

1. *Low Nitrogen Diet.*

Breakfast.—Milk 4 oz., porridge 8 oz., bread 2 oz., butter ¼ oz. Fluids: Coffee 10 oz., milk 2½ oz.

Lunch.—Bread 3 oz., butter ½ oz., lettuce or tomato 1½ oz. Fluids: Milk 5 oz., barley water 10 oz.

Dinner.—Potato 4 oz., greens 5 oz., butter ¼ oz., stewed fruit 4 oz., boiled rice 4 oz. Fluids: Lemonade, imperial drink, or barley water 12 oz.

Tea.—Bread 3 oz., butter ½ oz., lettuce or tomato 1½ oz. Fluids: Weak tea 10 oz., milk 2½ oz.

Supper.—Potato 4 oz., butter ¼ oz., greens 5 oz., stewed fruit 4 oz. Fluids: Lemonade or barley water 12 oz.

This diet contains: Protein 49 grams; carbohydrate 358 grams; fat 35 grams. Caloric value 1,992.

2. *Moderate Nitrogen Diet.*

Breakfast.—Egg 1 oz., bread 2 oz., butter ¼ oz. Fluids as in No. 1 diet.

Lunch.—Bread 4 oz., butter ½ oz., tomato or lettuce 1 oz. Fluids as in No. 1 diet.

Dinner.—Mutton or fish 3 oz., bread (alternate days) 2 oz., butter ¼ oz., stewed fruit 4 oz. Fluids as in No. 1 diet.

Tea.—Bread 4 oz., butter ½ oz., tomato or lettuce 1 oz. Fluids as in No. 1 diet.

Supper.—Greens 2 oz., potato 3 oz., bread 4 oz., butter ½ oz., stewed fruit 4 oz. Fluid: Milk 5 oz.

This diet contains (on average): Protein 63 grams; carbohydrate 407 grams; fat 91 grams. Caloric value 2,772.

These diets have proved suitable in the experience of other observers also. Alcohol is certainly undesirable in azotæmic nephritis.

It is generally recognized now that there are decided dangers in lowering the raised blood pressure in azotæmic nephritis by means of vaso-dilators. The rise of blood pressure is compensatory and should only be treated by such methods as help in eliminating the toxins whose action is forcing the pressure up. For this purpose I find the internal administration of tincture of iodine as useful as anything. Sometimes a small dose, say ½ grain, of thyroid extract twice a day will help this. Gentle exercise in the open air will also assist in the physiological lowering of blood pressure.

The necessity for a raised blood pressure in this type is illustrated by the case of a man admitted under my care with chronic interstitial nephritis and much dyspnœa. His blood pressure was 160 mm. systolic and 100 diastolic. On 15 minims of tincture of digitalis three times a day his blood pressure rose to 200 mm. systolic and 125 mm. diastolic, while his blood urea fell from 100 to 40 mg., and his general condition greatly improved. Evidently his blood pressure on admission was too low for due elimination of nitrogen by his defective kidney, and it had fallen through cardiac insufficiency. When the condition of the heart was improved by digitalis, it was able to cope more successfully with the necessities of the situation. In such a case to lower blood pressure is to court disaster.

A case of azotæmic nephritis may terminate through failure of the pump, the tubing, or the filter; in other words, through heart failure, rupture of a vessel as in cerebral hæmorrhage, or uræmia.

Uræmia.

What signs and symptoms can rightfully be included under this heading? Personally, I should exclude the diarrhœa and vomiting which may be regarded as alternative methods of excretion. I have already pointed out that 8 grams of nitrogen can be eliminated by the bowel in this way; and Graham has shown that considerable quantities of ammonium salts are present in the vomit of a uræmic patient. The skin rashes I should also look upon as an attempt to excrete toxins. This leaves us with three groups of symptoms which can be fairly classed as uræmic, but I would urge that these groups are due to different toxic substances and are of different significance.

1. *Convulsions and Amaurosis.*—Though very dramatic symptoms, these are really of less serious significance than the others. Patients may recover not only from the attack, but actually from the nephritis. They may occur also in eclampsia and toxæmic kidney, both conditions from which recovery may be complete. In my series of 160 cases of war nephritis convulsions occurred in 8. They all recovered and escaped without permanent damage to the kidney. It has been suggested that these symptoms are due to some toxin acting on the liver rather than to the kidney lesion. On this view I am in favour of treating such patients with insulin and dextrose, since a hepatic toxæmia is best helped by providing an ample store of glycogen in the liver. But there is no doubt that the best and most rapid relief can be given by prompt venesection. Bennett ingeniously compares the convulsions to tetany, pointing out that there is a reduction of blood calcium in both conditions.

2. *Uræmic Asthma.*—The sufferer from this has been graphically described by Rose Bradford as "a drowsy patient, with hissing respirations and bleeding gums." I believe that the cause of this distressing syndrome is acidæmia from failure of the kidney to excrete acid sodium phosphate. The hydrogen-ion concentration of the blood is consequently raised and the dyspnœa is an attempt at compensation for this by washing out carbon dioxide from the lungs. A compensated alkaline defect may exist without dyspnœa, but an uncompensated alkaline defect will cause dyspnœa and calls for free administration of alkalis. De Wesselow finds that a rise of blood phosphates and a fall in calcium content go together.

3. *Headaches; drowsiness; twitchings; hemiplegia; monoplegia; neuralgias; formication; pruritus.*—All this group of symptoms appear to be associated with nitrogen retention. The actual cause of the symptoms seems to be exudate of lymph and even of actual blood through the capillary wall, especially into the cerebral and the subcutaneous tissues. Small punctiform hæmorrhages are commonly seen in necropsies on uræmic patients, and large or small purpuric areas in the skin are not infrequent. Canti considers that a blood urea of 300 mg. is a sure portent of a fatal issue; and I should agree, though I have had one case with a blood

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

urea of 500 mg. reduced to 70 mg. under treatment, and sufficient clinical improvement for the patient to leave hospital. He died, however, about six weeks later. In this case, as there was no dyspnœa, the plan of giving hydrochloric acid was adopted, and the improvement certainly appeared to follow this. It has been suggested that in this way toxic amino-acids are converted into ammonium chloride, but I am not convinced that this is chemically sound. But, as already pointed out, dyspnœa implies an acidæmia calling for free administration of alkalis, under which I have also seen some slight fall in blood urea.

In connection with nitrogen retention, I should like to call attention to the different results given by the hypobromite and urease tests for non-protein in the blood. The former method gives the amino-acids as well as the urea, the latter the urea only. Now in health 92 per cent. of the nitrogen given by the hypobromite test comes from the urea, but it must not be assumed that a similar proportion exists in disease. I have, indeed, found the hypobromite test yield twice as much nitrogen as the urease test in uræmia. In other words, in uræmia there is a large increase in the relative and absolute amount of non-protein nitrogen other than urea, and it is presumably this "unknown" amino-acid fraction which is toxic, since urea is a harmless substance. If only one method is going to be used, it is better to employ the hypobromite test. But using both gives most useful information as to the amount of toxic material.

This is well illustrated by the great rise of blood urea, sometimes accompanied by tetany, in cases of pyloric obstruction and in toxic conditions severe enough to produce anuria; here the hypobromite and urease methods may give identical figures showing that a rise of blood urea is merely secondary to failure of excretion; there is not, at any rate at first, any excess of amino-acids produced by altered metabolism. Pyloric obstruction presumably acts by preventing ingestion of fluids into the blood stream, so that there is not sufficient for the kidney to function properly. The combined use of the hypobromite and urease methods is a useful way of recognizing such conditions and of proving that they are not primarily renal in origin.

It will be seen that I do not subscribe to the doctrine sometimes advanced that the symptoms of uræmia are due to one specific toxin, albeit of unknown nature. On the contrary, it seems to me that the three different groups of symptoms above detailed are much more likely to be due to different chemical poisons.

Conclusion.

In conclusion, I am conscious that these more recent investigations appear to have had a destructive rather than a constructive effect on treatment. This must be admitted, but new aids to treatment will surely spring from a sounder pathology. In the meantime, our patients will do all the better and be more comfortable if we realize that many of the methods formerly recommended in the treatment of these diseases are impotent where not actually harmful.

The Treatment of Pulmonary Tuberculosis.

By F. G. CHANDLER, M.A., M.D., F.R.C.P.

(*The Practitioner*, May, 1929, Vol. CXXII, p. 273.)

THE treatment of pulmonary tuberculosis will depend in some measure on the type and extent of the disease. If when the patient first comes for advice, there is widespread involvement of one lung with evidence of activity, either with or without cavity formation, then some special treatment will probably be indicated. This is true also in such cases as uncontrollable hæmorrhage and a rapidly spreading tuberculous broncho-pneumonia. The special treatment I refer to is chiefly artificial pneumothorax, the marvellous efficacy of which never ceases to astonish me. This will be discussed later.

If the disease is early and proved by the discovery of tubercle bacilli in the sputum or in the fæces, strict treatment on sanatorium lines should at once be instituted and the patient must be warned at the outset that treatment, though not necessarily at a sanatorium all the time, will be necessary for at least a year. Many will not submit to this, but, nevertheless, it is our duty to advise it. Failures are often due to the shortening of this time period. We are tempted again and again to yield to the appeals of the patient because of financial and domestic difficulties, but nothing is gained by it, for it only means more loss of time from work later and a recrudescence of the disease and a worse prognosis. If the patient's work is not suitable, it is better to consider changing it from the outset. This, however, is a counsel of perfection which frequently cannot or will not be followed.

If the symptoms are so suggestive that a diagnosis of tuberculosis cannot be dismissed yet tubercle bacilli are not found in the sputum or fæces, the *x*-ray picture is negative, and there is not that complete conjunction of cardinal symptoms that is almost proof positive of tuberculosis, even without finding tubercle bacilli, then, in my opinion, the advice to take a long holiday with rest, fresh air and good food is probably sufficient.

When according to the criteria already mentioned, we recommend sanatorium treatment, we may expect one of several reactions on the part of the patient. If he is endowed with that rare possession, common sense, he will probably accept the view held by all experts, that the greatest of all remedies are rest and fresh air, and that the knowledge how to use these to the best advantage can only be obtained under expert supervision. Unfortunately, however, a great many *medical* men do not appreciate the paramount importance of rest nor what actually is meant by it. Others will say that nothing on earth will induce them to go to a sanatorium—they would be so affected by the sight of sick people, they would be afraid of catching the disease worse. We have to explain that they will meet there many who are far fitter than themselves, that any danger of a sort of super-infection is a myth, and that at a well-appointed, well-disciplined sanatorium the danger of a spread of infection is probably less than elsewhere.

Another reaction may be that the patient will be incredulous and careless and cannot be bothered by irksome restrictions, and, unfortunately for the rest of mankind, sometimes he is lucky and Nature heals the lesion with no co-operation, and during the healing period he is a danger to others. Another is that at the word "tuberculosis" he flies into a panic, and, finding that the doctors will not guarantee a cure and do not boast a certain specific which will cure him surely, permanently and speedily, he flies off to some quack who readily gives such a guarantee, and, again unfortunately for the rest of mankind and for the cause of truth, Nature will sometimes assert herself and cure the disease, and the quack or charlatan gets the credit.

Another reaction is a kind of reflex. At the word "tuberculosis," the word "Switzerland" flies to the mind. One has to explain that patients will do better lying in an East End hospital than walking about among the most beautiful mountains of Europe. Switzerland is beautiful, sunshine may be enjoyed when there is but little in this country, the so-called diaphaneity of the air is greater and the beauty of the scenery may prove a great mental stimulus, but I am convinced that there is no special magic about Switzerland and that patients can be completely and permanently cured by proper treatment in England.

(1) *Rest.*—Of all treatment, rest is the most important. If there is fever, rest in bed should be prescribed until the temperature has been practically normal for three weeks. If there is much fever, patients must rest absolutely, neither feeding nor washing themselves. As the temperature falls, first feeding and then washing are allowed and then the use of the lavatory. When the temperature has become perfectly normal, it must be impressed on the patient that it is rest and not exercise that is needed. Very gradually increasing exercise on the level, carefully controlling it by the temperature chart, is allowed; no violent exertion is advisable for two or three years.

(2) *Sunshine.*—Sunshine, though used so successfully in the cure of bone and joint tuberculosis, has been

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

looked at a little askance in pulmonary tuberculosis. For all that, I believe that it is of great value; but it must be employed with great caution and the technique advocated by Rollier at Leysin must be followed. The first part to be irradiated should be the feet and legs. The affected part must very gradually be approached and cautiously exposed. The head must be protected and the sunbath must end as it began—by exposure to the feet. The exposures must be carefully controlled by the temperature chart and the pulse rate.

(3) *Climatic Treatment.*—The criteria of a suitable climate should be freedom from damp and bleak winds, a dry subsoil, freedom from dust and crowds of people, the maximum of sunshine, hill rather than valley. But I would emphasize again that it is the life lived rather than the place in which it is lived that is the more important. The advantages of high altitudes in the mountains are the long weeks and months of unbroken, unfiltered sunshine, the clear, pure, bracing air and the inspiring scenery. That all these are good is, of course, obvious, but I would again stress this—that if the right kind of life be not lived then there is little advantage.

(4) *Institutional Treatment.*—In my opinion, the sanatorium is or should be the ideal place for the treatment of the tuberculous patient. It must be fully equipped, however, and the discipline must be good. All advantages are lost if patients with evening temperatures are dancing and drinking cocktails, and instead of taking their prescribed amount of exercise are strolling to the nearest bar and drinking, coming back and faking their temperature, and if the mental atmosphere of the place is one of seething discontent, introspective valetudinarian conversation, and malicious gossip. I am not suggesting that these practices are invariable or that they are confined to the sanatoria of any particular country; but that they do occur I know, and the ignorance and folly of the patients who act in this manner pass all comprehension. Many sanatoria will not take patients while they are febrile. This is for two reasons. The first that by so doing they protect themselves from the very advanced case which is, as a rule, quite unsuitable for sanatorium régime (though it is only too painfully evident that institutions for such cases are urgently needed). The second is a domestic reason. Febrile patients need more nursing and more attention. With the introduction of recent methods of treatment, however, it is obvious that a fully-equipped sanatorium will welcome many febrile cases and will be willing to admit, temporarily, advanced cases in the hope that they may prove unilateral and amenable to special treatment. This is one of the great advantages of a sanatorium. The patient can be watched for long periods under ideal conditions. The progress can be observed and the need for special treatment decided upon and advised at the right moment. Another advantage is that patients are taught how to use fresh air, how to rest and how to exercise. If a sanatorium cannot do all these things and does not teach all these things, it is failing in its duty and is a bad sanatorium.

(5) *Medicinal Treatment.*—So far as we know, there is no medicine given by mouth or spray or inhalation or injection into the wind-pipe that has any specific action against the tubercle bacillus. Of the supposedly specific remedies I will speak later. Nevertheless, there are many substances which have a reputation for doing good, and it is of immense psychological importance to have at our command many remedies in a long protracted illness.

One of the oldest that is still used, having survived the vicissitudes of many centuries, is tar. Dioscorides, surgeon to Nero, strongly recommended its use in phthisis, and creosote is prescribed daily at the present time. It is given in enormous doses at Victoria Park and I have never seen it do any harm. Its psychological effect is great; whether it has any other value I do not know. I am inclined to doubt it. The allied substances, guaiacol and ichthyol, can be used. Arsenic, I think, is of value, and also tonics such as iron, quinine, hypophosphates, glycerophosphates. Iodine and intensive iodine treatment have been employed, but there is no evidence that it is of any special merit.

The efficacy of cod-liver oil is well known. It is valuable for its nutritive properties and vitamin content. An attempt has been made to isolate a specific substance, but it has not so far been successful. Malt is both a food and a digestive ferment and contains, of course, vitamin B. Calcium has some reputation in the treatment of tuberculosis, and many wild claims have been made for it. Successive generations of my house physicians, fired by enthusiasm after reading these reports, ask permission to use it, so that I have had plenty of opportunity of watching its effects, but I have not been very favourably impressed. It is, however, well worth trying, especially in acute cases, in one or other of the various preparations available. Yeo's inhaler—with carbolic, creosote, chloroform, iodine and ether—is also worth trying.

For the relief of cough much ingenuity may be needed. Open air will frequently stop all coughing. The patient must learn to relax and to let the cough be useful and not paroxysmal. It is surprising how greatly the cough can be lessened as the patient is taught control. Such simple remedies as glycerine and lemon, and black currant sweets may help, or pastilles of slippery elm or menthol and cocaine may be used. Other preparations which help greatly are hydrocyanic acid, numerous opium preparations, tinct. camph. co., linctuses containing some form of opium or heroin, the delectable syrupus cocillana co., cocaine and cannabis indica. An excellent list of remedies for cough will be found in the Therapeutic Index of Martindale and Westcott's Extra Pharmacopœia.

AFTER-CARE.

Points to be observed after the definite treatment period comprise the following:—

(*a*) The general condition of the patient.
(*b*) The weight.
(*c*) The evening temperature—6-30 p.m., two or three years.
(*d*) Sputum examination.
(*e*) Physical signs in the chest.
(*f*) Periodic *x*-ray examination.

It is exceedingly difficult to persuade patients to submit to these precautions. It depresses them. They like to think themselves cured and to take no further thought for the body. I deeply sympathize with this attitude, but alas! it is foolish policy and one which over again leads to disaster. We must explain that taking these precautions should not lead to worry and introspection, but do, in fact, remove the cause for worry. Slight exacerbations may occur from time to time, causing a rise of temperature. If the patient will rest at these times, he will prevent a lighting up of a small focus and gain more immunity. Herein lies the value and importance of such an institution as the Papworth Colony, where patients can work under suitable conditions and under observation.

SPECIFIC TREATMENT.

If under the régime mentioned above the disease continues to advance and it is bilateral, can we make any attempt at specific treatment? There are four possible ways known to us of treating infective disease specifically:—

(*a*) Killing bacteria direct.
(*b*) Neutralizing toxins.
(*c*) Stimulating antagonistic mechanisms, whether in blood or tissues.
(*d*) Making an unfavourable soil or medium for the growth of the organism.

In tuberculosis there are three remedies for which specific claims have been made:—

(1) Sera.
(2) Tuberculins.
(3) Gold (Sanocrysin or Crysalbine).

(1) *Sera.*—From time to time antitoxic sera have been introduced. Starting with the usual flourish of trumpets and the usual record of marvellous results, they have enjoyed a brief season of favour and then have been found wanting. Such were Maragliano's and Marmorek's serum. In another category was Mr. Spahlinger's serum, which I have had opportunities

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of testing and which now rests obscured beneath a well-deserved cloud. Of Unlenhuth's serum, a horse serum prepared by injecting horses with virulent tubercle bacilli, I have had no experience nor have I heard of any recent results. An antiserum was at first used in the early days of the administration of Sanocrysin, made by injecting horses with Dreyer's diaplyte tuberculin, but was soon given up as useless.

(2) *Tuberculin.*—So plausible are the claims made from time to time on behalf of different tuberculins that I am almost compelled to review and re-review my opinion and to try and try again. But I am afraid it is the old story once more—a new tuberculin, an evanescent popularity, then swift decline. I have not had a large personal experience of the older tuberculins; but when Dreyer's diaplyte tuberculin was first introduced, through the Medical Research Council and the energies of Dr. S. Roodhouse Glyne, I was able, with my colleague, the late Dr. Clive Riviere, to make a fairly exhaustive test of this, but found it useless. It was possible, in acute cases, to work up to enormous doses, to desensitize patients completely to tuberculin, yet with no beneficial effect whatsoever on the clinical course of the disease. To test it further, I tried giving enormous initial doses in cases of tuberculous meningitis and got no reaction at all of any kind, which would appear to show that it has no influence at all on closed tubercles. Nevertheless, as a non-specific protein shock reaction it may do good in certain cases, if carefully controlled, and it seems that it is on the lines of tissue stimulation rather than on bactericidal action that we have the greatest hope of curing the disease.

(3) *Gold Salts.*—For a long time gold has had a reputation in the cure of tuberculosis. Many other substances have also been tried—antimony, arsenic, calcium, cobalt, copper, mercury, nickel, silver, sulphur—yet none has proved of real value, though some have obtained temporary popularity. An exception ought perhaps to be made in favour of arsenic, which, given as Fowler's solution, does appear to have some sort of tonic effect.

I remember in 1913 seeing several cases treated by potassium auro-cyanide. More recently Professor Mollgard has introduced the well-known double thiosulphate of gold and sodium; Crysalbine is a similar preparation. Knud Secher, in his book on Sanocrysin, published in 1926, claims that if used at the right stage it is possible to obtain with Sanocrysin a *sterilisatio magna.* Needless to say, it is a greatly exaggerated claim which subsequent experience has by no means confirmed. During the last three years I have treated between forty and fifty cases with gold, and I am still in a state of uncertainty with regard to its value. I have chosen two types of cases—the one, patients with advanced disease, who are obviously going rapidly downhill with what is called the exudative rather than the fibrotic type of tuberculosis; and the other, patients who, while not afflicted with a large area of disease, are unable to put up any effective resistance, and who, in spite of prolonged sanatorium treatment, remain constantly febrile with tubercle bacilli constantly present and who are slowly losing ground. Of the cases I have treated, ten have responded in what appeared to be a very striking manner, losing their fever and their tubercle bacilli, with the picture changing from one of steady progress of the disease to an arrest of it. For the remainder, and by far the greater number, no beneficial effect was obtained. Of course, the difficulty in these successful cases is to know what would have happened if Sanocrysin had not been used, and time alone will show whether Sanocrysin is really effective. In the second type of case I have mentioned, I think it is well worth trying if the patient does not experience any unpleasant or serious reactions. At the beginning, we used much larger doses, but now the general consensus of opinion is in favour of small doses beginning with 0.05 of a gram, giving injections at six-day intervals, and working up to 0.1, 0.25 to 0.5 of a gram and continuing at this dose until the patient has received 5 grams. The course is then repeated a few months later. Sometimes when there is no reaction I still occasionally give 0.75 of a gram at one dose, but I no longer give the full gram.

An aura of suspicion seems to rest over Sanocrysin because of stories of terrible reactions. Such reactions are possible, but if care be taken they are very unlikely to occur. It must be given intravenously with the same precautions as salvarsan, as it is extremely irritative to the tissues. Reactions that may occur are albuminuria, which, if slight, may be ignored; but if blood cells and casts appear in the urine, injections must be stopped until the urine is absolutely normal. Other reactions include ulceration in the mouth, nausea or vomiting after the injection, diarrhœa, a generalized scarlatinal erythema which soon passes off and does not seem to matter much, and lastly, dermatitis with loss of hair. At the slightest sign of dermatitis the injections must be stopped and, in my opinion, never repeated. If small doses are used and all reactions carefully observed, no serious complications should arise.

SURGICAL PROCEDURES.

If the case be unilateral and progressive, in spite of the most careful treatment, there can be not the least doubt that something more should be done.

(1) *Artificial Pneumothorax.*—With this method of treatment, when successfully induced, we can completely rest the lung and in many cases stop the progress of the disease. It is simple, painless, and, if not doing good, can easily be undone. It is one of the most ingenious methods of treatment ever devised and one of the most dramatically successful in its results. In spite of this I am altogether opposed to employing it in early cases of pulmonary tuberculosis. In all cases I would give Nature every chance to heal the patient. There are many reasons for this which have been put forward so many times that it is not necessary, even if there were time, to do so again now. Apart from severe recurrent hæmoptysis and a rapidly spreading tuberculous bronchopneumonia, the following is what I consider the indication for artificial pneumothorax—unilateral disease, which is spreading in spite of careful and prolonged treatment on strict sanatorium lines—it should not depend on the extent of the disease. It may be difficult to know exactly when to decide to step in and induce pneumothorax, but if the case is under observation it usually, sooner or later, becomes obvious when this should be done. If there is fever which will not subside, if there are repeated hæmorrhages, if tubercle bacilli are constantly present in large numbers, if there is a cavity which is increasing rather than diminishing, if the general condition of the patient is not good, if he is unable to get about without showing signs of toxic absorption, if signs and the *x*-ray picture show an increase of the affected area, then artificial pneumothorax should be considered. The length of time during which it must be kept up will vary greatly according to the case, and the termination of a pneumothorax is often a most difficult and anxious problem. If, however, the patient can be observed carefully during the process of expansion of the lung, then it is usually, but not always, possible to know whether any reactivation of the disease is taking place. In any case, it is better to warn the patient that the treatment will probably be necessary for at least two or three years—in advanced cases longer.

(2) *Oleothorax.*—A common complication during the course of artificial pneumothorax is a pleural effusion. This can frequently be ignored and it will disappear. Sometimes it can be allowed to remain for quite a long time with no apparent ill effects. Sometimes, however, the amount of fluid is so great that tapping is necessary and then, if a tendency to repeated reaccumulation of fluid occurs, there is a danger of the pleural space becoming smaller and a condition known as obliterative pleurisy may occur, which will undo all the good work that has been done and is one of the dreaded complications of the treatment. The same may occur after two or three attacks of pleurisy with a comparatively small amount of fluid. When obliterative pleurisy has once well started, no amount of air pressure will keep the pleural layers apart. Little by little, with invincible force, the tentacles of contracting fibrous tissue draw the

GC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Comfort—

Symptomatic Relief—

Sterilisation of Urine

are the immediate results of the administration of the urinary antiseptic

CAPROKOL

(Hexyl-resorcinol B.D.H.)

In capsules for adults In solution for children

Descriptive literature and clinical reports will be sent on request to the B.D.H. resident representatives in India:

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Bldgs.,
Parsee Bazar Street,
Fort, BOMBAY.

THE BRITISH DRUG HOUSES LIMITED
LONDON

Ca/In/299

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"TRADE MARK NORMACOL" BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

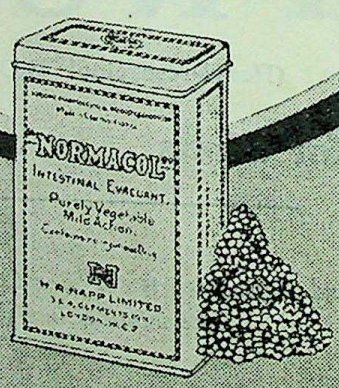
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H.R.NAPP LIMITED.

3 & 4, Clements Inn, London, W.C.2.

Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two Lines.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

pleural layers together from below upwards. By drawing off the fluid and replacing it by olive oil containing 5 per cent. oil of gomenol, this process may be prevented. Even though the pleural layers come together at the base, the oil will be driven to the upper part of the chest and then the space can be contracted no farther and it is usually just this upper part that we want collapsed. In this way, a condition which might render the severe surgical procedure of thoracoplasty necessary may be prevented.

(3) *Phrenic Avulsion.*—If because of adhesions an artificial pneumothorax cannot be induced, what other method have we at our disposal? The simplest is phrenic avulsion. Under a local anæsthetic the phrenic nerve is exposed in the neck, held with forceps, cut above and then carefully dragged out by gentle pulling until the whole length and some of the diaphragmatic branches come out whole.

This is specially indicated in basal tuberculosis and may be sufficient to bring about an arrest of the disease. It is worth trying in any case, even though it be but a preliminary to more drastic procedures. The reaction is usually very slight. Patients can even walk about the day after the operation.

(4) *Apicolysis or Pneumolysis.*—If the disease be apical, the next least severe procedure is the so-called apicolysis. An incision is made between the second and third ribs or in the axilla; the ribs are retracted, the parietal pleura is stripped from the chest wall by the hand, and the whole of the upper lobe pressed down by the fingers or fist. Into the space so produced either fat or plastic paraffin is pressed and the incision sewn up firmly. It is an excellent operation involving little shock, but unfortunately both of the packing substances used are apt to be extruded little by little through a pin-hole sinus. Nevertheless, though this may happen, a large apical cavity may remain closed with its walls adherent.

By pneumolysis is meant a similar stripping of the parietal pleura and packing over some part of the lung other than the apex.

(5) *Thoracoplasty.*—If these methods fail or if the disease is too extensive for the lesser procedures, then thoracoplasty must be considered. Performed on the right type of case the results are marvellously good. I have seen most brilliant and lasting results from the operation, but there is no disguising the fact that it is a big operation and one would think more than once before recommending it. It demands the most perfect technique and the most complete comprehension of what is to be achieved. The following are the types of cases suitable for a thoracoplasty:—

(*a*) If a successful artificial pneumothorax has been allowed to terminate and there has been a recurrence of symptoms and recollapse is not possible.

(*b*) If an artificial pneumothorax be imperatively indicated in a case of progressive unilateral disease, yet by reason of adhesions it is not possible to induce one.

(*c*) If chronic unilateral disease is present causing distressing symptoms—excessive expectoration, recurrent hæmoptysis, fever, inability to work, etc.

(*d*) In cases of persistent tuberculous empyema causing toxic symptoms, which will not yield to air or oxygen replacement or replacement by gomenolized olive oil.

The Treatment of "Crescent Carriers" with Plasmoquine Compound.

By RICHARD GREEN, M.B., B.S.

(Abstracted from *Bulletins from The Institute for Medical Research, Federated Malay States,* No. 3, 1929, p. 1.)

SUMMARY.

(*i*) AMONG 741 cases infected with *P. falciparum*, examined prior to quinine treatment, the average percentage of gametocyte carriers was 42.3 over a period of seven months, the monthly variation being from 30 per cent. to 56.1 per cent.

(*ii*) In 250 cases infected with *P. falciparum* given an average of 7.1 days of quinine treatment and examined before and after treatment, it was found that the number of cases with gametocytes had increased and that among these the numbers provisionally regarded as capable of infecting mosquitoes had also increased.

(*iii*) Fifty-six cases of sub-tertian malaria showing the presence of gametocytes in the blood were treated from ten to fourteen days with plasmoquine compound, being given a daily dose of 0.04 grm. plasmoquine and 0.5 grm. quinine. Among these, crescents disappeared from the peripheral blood within an average period of 7.9 days, limits 4 to 13 days. Trophozoites were present or reappeared after the third day in 21.5 per cent. of the cases.

(*iv*) Ten similar cases were given quinine, grains xx daily, with an additional number of five crescent free cases, making a total of 15 controls. In the ten cases with crescents these did not disappear during the course of observation and treatment; that is, from 12 to 20 days, but in all cases, no trophozoites were to be found after the third day.

(*v*) Abdominal pains occurred among 5.4 per cent. of the cases receiving plasmoquine compound. No further toxic symptoms were observed.

(*vi*) With the dosage of plasmoquine compound employed, no evidence of renal damage or adverse effect on either the cardio-vascular system or hæmoglobin could be found.

(*vii*) Slow pulse rates between 40 and 50 per minute while the patients were reclining were observed with equal frequency among the patients treated with plasmoquine compound and those treated with quinine.

(*viii*) The average reduction in the size of the spleen over a period of ten days among cases in which measurements could be made, was 4.2 cm. in the cases treated with plasmoquine compound and 2.3 cm. in those treated with quinine.

CONCLUSIONS.

The results recorded appear to justify the following conclusions:—

(1) Quinine is not an effective drug when used over periods of less than 21 days with the object of destroying the gametocytes of *P. falciparum.*

(2) A dose of 0.04 grm. plasmoquine daily in adult sub-tertian cases is an efficient gametocide among Asiatic hospital cases as described. The dosage is sufficiently free from toxic effects to be given to these patients, but continuous medical supervision is necessary in view of the narrow margin between the effective dose and that which may cause toxic symptoms. This dosage is sufficiently active against gametocytes to be effective in sterilizing all but a very few "crescent carriers" during a period of approximately twelve days.

(3) In its present form plasmoquine compound is not a well-balanced drug and although the two drugs may be given separately and each be effective in its own sphere, a combination permitting the convenient daily administration of 0.04 grm. plasmoquine and gr. xx quinine would be an advantage in treating cases of sub-tertian malaria which are also "crescent carriers."

The Treatment of Quartan Malaria with Plasmoquine.

By RICHARD GREEN, M.B., B.S.

(Abstracted from *Bulletins from The Institute for Medical Research, Federated Malay States,* No. 3, 1929, p. 21.)

SUMMARY.

(*i*) FORTY cases of quartan malaria were given 0.06 grm. plasmoquine daily. Ten control cases were given quinine hydrochloride gr. xx daily.

(*ii*) The average time of disappearance of quartan parasites, including gametocytes from the peripheral blood among the cases receiving plasmoquine treatment, was 6 days; limits 4 to 9 days.

(*iii*) Among the cases treated with quinine the average time of disappearance of all forms of the parasite

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

was 10 days; limits 4 to 14 days. In two cases gametocytes were still present on the eleventh and sixteenth days of treatment.

(*iv*) Ten per cent. of the cases receiving plasmoquine complained of abdominal pains. Five per cent. had cardiac irregularity which was regarded as being due to the drug. No further toxic symptoms were observed.

(*v*) Pulse rates below 45 per minute were met with in 6.6 per cent. of the plasmoquine cases and in 25 per cent. of the quinine cases.

(*vi*) The average diminution in the size of the spleen was 3.45 cm. in the plasmoquine cases and 4.9 cm. in the quinine cases.

(*vii*) In doses of 0.06 grm. daily, no evidence was found that plasmoquine caused albuminuria or that it influenced unduly the blood pressure or hæmoglobin content.

CONCLUSIONS.

(*i*) Plasmoquine appears to be somewhat more efficient than quinine in destroying both sexual and asexual forms of *P. malariæ*.

(*ii*) A dose of 0.06 grm. daily given to 40 male Asiatic patients, whose average weight was 48.5 kg., did not give rise to severe toxic symptoms but as the gametocidal effect of plasmoquine appears to be somewhat greater than that of quinine, it would probably be of advantage to combine quinine with smaller doses of plasmoquine for the treatment of quartan cases. A dose of 0.04 grm. plasmoquine in combination should be sufficient for the type of patient described.

GENERAL CONCLUSIONS REGARDING PLASMOQUINE.

(*i*) Plasmoquine appears to be more efficient than quinine in destroying the gametocytes of both *P. falciparum* and *P. malariæ*.

(*ii*) The addition of 0.04 grm. plasmoquine daily to quinine treatment of adult cases should be an advantage from the epidemiological view-point in cases of subtertian malaria which have crescents in the blood. For cases of quartan malaria a similar dosage for the purpose of more rapidly freeing patients from gametocytes might be considered.

(*iii*) No evidence has been found among 96 cases that plasmoquine causes bradycardia.

(*iv*) The contradictory results observed in the subtertian and quartan cases do not permit the conclusion that plasmoquine causes a more rapid reduction than quinine in the size of spleens which have become enlarged as the result of malarial infection, nor do they, on the whole, support the suggestion that abdominal pains observed among cases taking plasmoquine are due to rapid reduction in the size of the spleen.

Colles's Fracture: An Efficient andEconomica Method of Splinting.

By W. MITCHELL SMITH, M.D., C.M.

(*Brit. Med. Journ.*, April 27th, 1929, p. 765.)

THE cost of after-care (massage, physiotherapy, and electro-therapy) in the treatment of fractures has been mounting up in recent years to an alarming extent. The time has come for the surgeon who prescribes this treatment—often as a matter of routine—to consider whether this expense is justified, or whether equally good, or even better, results might not be obtained by well-considered splinting.

Efficient splinting should ensure complete immobilization of the fragments after reduction, and, in the case of the Colles's fracture, fixation of the hand in such a position that the patient is able to use it as soon as the damage to the soft tissues begins to subside. Jones's and Carr's splints are the two most commonly used. The former provides the more perfect fixation of the fragments; the latter the better position from which to start re-education. I find that the best features of both splints can be combined in a carefully applied plaster case.

The treatment of a Colles's fracture may be divided into three stages: (*a*) reduction of the fracture; (*b*) splinting; (*c*) after-care.

A. *Reduction of the Fracture.*

Reduction of the fracture under an anæsthetic can generally be easily obtained by steady traction on the hand and manipulation of the fragments into position by the thumb and forefinger. If more force is required the well-known manipulation of Sir Robert Jones provides all that is necessary; but as little force should be used as possible. Complete reduction is indicated by the restoration of the radial curve, as described by Sir Robert Jones, and of the correct relationship of the styloid processes.

B. *Splinting.*

A roll of stockinet is run up the arm, extending from the knuckles to the elbow. Over this a light plaster case is applied. With the thumb and forefinger of one hand the surgeon holds the fragments of the radius in the corrected position, and with the other hand holds the wrist in about 15 degrees of dorsiflexion and slight ulnar deviation while the plaster sets. It is essential that the plaster should be closely moulded to the dorsum of the wrist and that the angle of dorsiflexion should be exactly opposite the joint. To prevent rubbing the skin, the plaster should extend, glove fashion, half-way up the metacarpals, and should allow full palmar flexion of the metacarpo-phalangeal joints.

The occurrence of pain and swelling of the fingers may be avoided by cutting out from the back of the plaster, before it sets, and from the underlying stockinet, a strip about half an inch wide, leaving a bridge at the top and the bottom. A radiogram to confirm the correction should be taken through the plaster.

C. *After-care.*

As soon as he recovers from the anæsthetic, the patient is encouraged to use his fingers and gradually to develop the use of his hand. In a week or ten days he is able to do anything within the limits imposed by a cock-up splint. The plaster case is removed at the end of a month, by which time bony union has generally taken place, and as the patient has already been using his hand freely for two or three weeks no further treatment is required.

I have been treating Colles's fractures by this method for the past three or four years with uniformly good results and with considerable saving in the cost of treatment.

Reviews.

MENTAL DEFICIENCY (AMENTIA).—By A. F. Tredgold, M.D., F.R.C.P., F.R.S. (Ed.) Fifth Edition (largely rewritten), 1929. London: Baillière, Tindall and Cox. Pp. XVI plus 535, with 35 illustrations and 12 tables. Price, 25s. net.

SINCE its first appearance in 1908, Dr. Tredgold's book has been rightly acknowledged to be the standard work on mental deficiency, a subject which he has made peculiarly his own. The years between the publication of the fourth and fifth editions have witnessed two events of importance in this particular field in England and Wales, first, the passing of the Mental Deficiency Act of 1927, and, second, the investigations of Dr. E. O. Lewis on behalf of the joint Mental Deficiency Committee of the Board of Education and the Board of Control.

With regard to the causation of mental deficiency in general (and it may be remarked in passing that the number of mental defectives in Great Britain relative to the general population is showing a disquieting increase), the author strongly upholds the view that in approximately eighty per cent. of cases the condition is due to inheritance. Other predisposing causes such as alcoholism, tuberculosis, syphilis and consanguinity of the parents are regarded by Dr. Tredgold as of relatively much less importance in the ætiology of primary amentia.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOWEL INFECTION
and
Pyorrhoea Alveolaris

"In the treatment of pyorrhoea alveolaris, unless intestinal sepsis is treated at the same time, and *overcome*, no local treatment of the dentist is more than palliative.

May 31st, 1924. ——, L.D.S., R.C.S."

"Nothing is more wanted in medicine than a reliable bactericide for the alimentary canal."

Prof. W. E. DIXON,
Examiner in Pharmacology, Universities of Oxford and Cambridge.

This want has at last been met

The most scientific method of treatment must obviously be the sterilisation of the putrefactive organisms in the intestines.

"By the introduction of the new benzene derivative dimethylomethoxyphenol[1]; the putrefactive organisms are destroyed and the B. coli, owing to their 'greater powers of resistance,'[2] under the changed environment are enabled to cast off their pathogenic virulence and resume their normal character. The significance of this addition to our therapeutic resources suggests the beginning of a new era in the treatment of disease; the fact that the poison trap of the intestines can now be brought under control may prove to be the solution of more than one hitherto undetermined pathological problem."

—*New York Medical Journal and Medical Record*, April 18th, 1923.

1. Now known by the convenient name Dimol. 2. "The Lancet," 1921, i., 758.

The efficiency of Dimol in the treatment of many other intestinal conditions of bacterial origin is conclusively told in the interesting clinical reports which, together with a brochure dealing with the pathological significance of the intestinal toxæmias, will be sent on application to the

Dimol Laboratories, Ltd., 40, Ludgate Hill, London, E.C.4.

Dimol can now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

***Vide* Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.**

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Incidentally it might be of interest from the historical point of view to have the opinions of Professor Elliot Smith and other Egyptologists on the effect of the consanguineous (and, in the eyes of modern civilisations, incestuous) unions contracted by some of the earlier Pharaohs: fortunately the question in practical form does not now arise.

The general structure and composition of the book are excellent and such criticisms as can be offered are directed against minor points only. It is probably true that "the importance of abnormalities of labour as a cause of amentia has been much over-rated," but the statement that "the proper use of the forceps can play no practical part in the production of amentia" overlooks the fact that the application of this instrument is still, we fear, far from "proper" in many cases. If the misapplication of forceps can produce permanent injury to the brachial plexus in a small but appreciable proportion of cases, surely it is even more capable of damaging the delicate cortical neurons—even in the absence of a "neuropathic predisposition."

We should like to have seen some mention made of the part played by malaria in the causation of mental deficiency and retarded mental development. Blanchi states that intensely malarious districts (of Italy) where the majority of the inhabitants have enlarged spleens and a certain degree of anæmia are veritable nurseries of imbecility. The same sequence was noted in France by Montfalcon over a hundred years ago and more recently by Conti in Sardinia. In this connection examination of the peripheral blood of the case described on p. 263 (mild amentia consequent on "meningitis" at fifteen months of age—in India) might have had interesting results. When Dr. Tredgold sets out to refute the popular misconception regarding the close relationship of mental abnormality to genius, he is doing sociology and psychology an undoubted service, but when he states (p. 507) that "the great majority of men and women of outstanding ability have been particularly sane and have come of sane and healthy stocks," he puts on himself the onus of defining a man (or woman) of outstanding ability. Cowper, Dean Swift and Coleridge were at least "unstable," while Byron was a high grade defective with a thoroughly bad family history. Charles Lamb, himself the gentlest and most loving of men, had a neuropathic heredity which weighed on him throughout life—witness his own incurable stammer and the sudden outbursts of homicidal mania to which his sister was so tragically subject.

Of actual errors there are few—and these trifling. "Recently" on p. 37 refers to a paper published as long ago as 1913 and the same word (on p. 213) to a paper dated 1912.

Dr. Tredgold is to be congratulated on his book having attained its majority, and the fifth edition will certainly enhance its reputation still further as the authoritative guide to those engaged in the study of mental deficiency whether it be from the clinical, pathological or sociological aspects. Printing and general format are excellent and the price is eminently reasonable.

J. M. H.

CONTRIBUTIONS TO PSYCHIATRY, NEUROLOGY AND SOCIOLOGY.—Dedicated to the late Sir Frederick Mott, K.B.E., Hon. LL.D., M.D., F.R.C.P., F.R.S. by his colleagues, friends and former pupils. Edited on behalf of the Mott Memorial Committee by J. R. Lord, C.B.E., M.D., F.R.C.P.E. London: H. K. Lewis and Co., Ltd. 1929. Pp. XII plus 401, with numerous illustrations. Price, in Great Britain 21s. net.

By the death of Sir Frederick Mott on 8th June, 1926, medical science in general lost an able leader and psychological medicine in particular one of its chief ornaments. The volume under review, comprising a series of thirty-one papers by former colleagues and students is a fitting tribute to him who inspired and taught them. Striking evidence of Mott's international reputation is afforded in the list of contributors—France, Germany and Holland, Italy and Switzerland, Norway and Denmark, Australia and Canada, Japan, America and England are all represented, and the range of subjects dealt with is equally varied—from a somewhat whimsical note on common errors in neurological nomenclature (by Sir Edward Sharphy-Schafer) to a study of the blood-sugar in mental disorders.

The article entitled "The Prevention and Early Treatment of Mental Disorders" by Sir Hubert Bond (one of the Commissioners of the Board of Control in England) is in some ways the most interesting and important of the series. For it emphasises—and it appears that emphasis is needed—the total inadequacy of the present Lunacy Laws in England. At the moment, certification and judicial intervention are essential preliminaries to treatment and there is practically no provision for the "patient" suffering from early but as yet uncertifiable mental disorder. That legal cognisance of the so-called "borderland case" has not yet been taken must, we think, be attributed to an ill-defined but lingering suspicion in the minds of the lay public that any extension of the existing laws to include those not demonstrably diseased in mind except to the critical examination of the expert might allow of perfectly sane persons being in some mysterious manner "put away" by the machinations of their enemies. Incidentally the law in Scotland is different (though Sir Hubert Bond does not mention the fact). Section 6 of 25 and 26 Vict. Cap. 54 (1862) intituled "an Act to make further Provision respecting Lunacy in Scotland" makes definite provision for allowing persons to enter asylums voluntarily.

The present vogue of malaria therapy in general paralysis of the insane is reflected by the presence of two articles dealing with this subject in the series under review. Evidence is gradually accumulating in support of the undoubted value of this mode of treatment; in this connection it is interesting to note that of sixteen cases so treated who afterwards came to autopsy at periods varying from three months to two and a half years from the cessation of treatment, in only one—a case of congenital general paralysis of the insane—were spirochætes found in the brain. This would appear to be significant, as these organisms can be found in the brains of about sixty per cent. of untreated cases. Another point of interest is the observation that cases showing a strongly positive Wassermann reaction in the cerebro-spinal fluid before treatment appear to have a better prognosis—other things being approximately equal—than those in whom this reaction is not so strongly marked. This raises the much bigger question as to whether the intensity of the Wassermann reaction in any given case is an index of the degree of infection or of the antibody response to infection in that particular case.

Mention must also be made of the charming appreciation of Mott from the pen of Professor W. D. Halliburton—a lifelong friend. Here we get an intimate sketch and one realises that to have had the privilege of Sir Frederick Mott's friendship was in itself a liberal education.

J. M. H.

ULTRA-VIOLET RADIATION & ACTINOTHERAPY —By E. H. Russell, M.D., Dunelm, and W. K. Russell, M.D., B.S. Dunelm. Third Edition, Edinburgh: E. & E. Livingstone. 1928. Pp. 648, with 259 illustrations. Price, Rs. 15-12 net. Messrs. Butterworth and Co. (India), Ltd., Agents in India.

ULTRA-VIOLET ray therapy owned its origin to the astute observations of many physicians and surgeons in the past. Hippocrates was aware of the beneficial effects of sunlight in certain cases, and since his day many have testified as to the accuracy of his observation.

With modern methods it is possible to control scientifically the rays which one administers to the patient, but only if the operator is fully cognisant of the physical principles involved. Much harm can be done by indiscriminate ultra-violet therapy, and only in the hands of a doctor who is also a radiologist is this treatment safe. The reviewer has known of many cases where bad results have occurred through ignorance of technique, but he has also known cases to recover under

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ray therapy, which was properly administered, which were almost hopeless. It is significant that ray therapy was prescribed for the King-Emperor with excellent results.

The lesson, then, to be drawn is that in ray therapy a powerful weapon is put into the hands of the physician, but the control of this power is essentially the domain of the specialist. Drs. E. H. and W. K. Russell, who present the same phenomenon as Monsieur and Madame Curie, of husband and wife working together for medical and scientific ends, are to be congratulated on their third edition of their "Ultra-Violet Radiation and Actinotherapy."

The work can be recommended both to specialists in the subject and to general practitioners, because the specialist will find the detail he requires in difficult and obscure cases in this book, while the general practitioner will be able to realise how many of his intractable cases can be benefitted, if not cured, by actinotherapy. He will also be able to realise the limitations of ray therapy, and know when not to expect too much.

There are a few statements in this book which require further amplification and proof, but in the main it is an excellent book, thoroughly to be recommended to all interested in ultra-violet therapy.

C. G. R. M.

LIGHT AND HEAT IN THERAPY (WITH A CHAPTER ON FOAM TREATMENT).—London: The Actinic Press. 1929. Pp. 174. Illustrated. Price, 6s. 6d. net.

THIS little book constitutes the *Proceedings of the Second International Congress of Heat and Light in Medicine and Surgery* held in London in 1928. It contains papers showing many advances in the subject. The names of the contributors, e.g., Sir Henry Ganvain, Drs. Franz Nagelschmidt, H. S. Cermach and W. Flashamp are sufficient in themselves to make the papers authoritative. One of the most interesting papers is that by Dr. Nagelschmidt who with Dr. Arsonval must be ranked as one of the two earliest pioneers in the value of diathermy. He has devised a new diathermy machine, working at a higher potential than usual and with condenser electrodes. By means of these he can raise the body temperature to any degree compatible with the safety of the patient and can maintain states of hyperpyrexia for indefinite periods. It will be very interesting to see and contrast the results obtained by this means in cases of progressive paralysis, as compared with those obtained with malarial therapy.

G. G.

THE PHYSICS OF X-RAY THERAPY.—By W. V. Mayneford, M.Sc. London: J. A. Churchill. 1929. Pp. 177, with 106 Illustrations. Price, 10s. 6d. net.

THIS little book, written for radiologists, deals with the physical aspects of *x*-rays especially as applied to therapy. The subject is treated in a concise but lucid manner. Mathematics, the *bête noire* of the average doctor, is conspicuous by its absence.

The chapter on *x*-ray measurements, giving details of the modern apparatus for the purpose, will be found especially useful.

G. G.

AN INTRODUCTION TO ANATOMY.—By N. S. Sahasrabudhe, M.S. With a Foreword by Dr. Y. G. Nadgir, M.S. Published by the Author. Sitabuldi. Nagpur, C. P. 1929. Pp. VI plus 236, with 13 Illustrations. Price, Rs. 3 (Inland), 7s. net (foreign).

THE book has been written with the object of making the method of study of anatomy easy and interesting to students. It contains 16 lectures, the first of which is on "Terms and parts of the body." Where such terms as "anterior and posterior, superior and inferior" have been introduced, no mention has been made of the "anatomical or formal position" of the human body. The second and third lectures are devoted to "general anatomy" in which the various systems to be studied have been introduced and explain the necessity for the existence of each system. The fourth lecture deals with some points in practical anatomy, such as the method of preservation of dead bodies and the subdivision of the entire body into parts for distribution to students for dissection. The distribution of the arm and axilla to one student and the remaining part of the superior extremity to another by dividing it below the middle of the arm is undesirable as it prevents the study of one part in continuity by the same student. The same disadvantage is met with in the proposed distribution of the inferior extremity by dividing it into two below the middle part of the thigh. The practical hints given for the use of the instruments for dissection will be extremely useful to beginners in dissection. The author impresses on his students the method of reconstruction and visualisation as the only means for carrying a mental picture of the dissected parts. Lectures 5 to 9 deal with the description of bones in a general way without going into details, and giving a rough idea of the position and parts of the bones. Lectures 10 and 11 deal with joints and muscles, laying stress on the method of study of these systems. Lectures 12 and 13 are devoted to the digestive, respiratory and urinary systems in a general way. The 14th lecture is on the circulatory system clearly explaining the pumping mechanism and the arrangement of the valves of the heart. The 15th lecture is on the nervous system and the last lecture covers the generative system, endocrinology, and the special senses in a general way. Though the author has generally followed the new terminology it has not been strictly adhered to. For the sake of simplicity anatomical accuracy has been ignored at many places, e.g., where the author calls the cavity of the mid-brain the 3rd ventricle and the dura mater the "water bag" outside the arachnoid. There are 13 illustrations and they are original and useful, though not in colour. The author is to be congratulated on introducing a method of study of anatomy on entirely new lines which may cultivate in students a strong power of visualisation, reasoning and self-help which are essential for the study of the important subject. The book should be useful to those studying anatomy for the diploma in nursing. The book however stands badly in need of revision and emendation.

A better get-up of the book and less typographical errors may be expected in the next edition.

N. P.

PUBLIC HEALTH AND HYGIENE: A STUDENTS' MANUAL.—By C. F. Bolduan, M.D. Philadelphia and London: W. B. Saunders Company. 1929. Pp. 312, illustrated. Price, 12s. 6d. net.

THIS is an attractively got-up book, worthy of the publishers' reputation. It differs from the usual run of elementary textbooks in that it gives an excellent historical survey of the growth of public health. Excellent pictures of all the well-known hygienists and medical discoverers are given, and the opening chapters give a very good resumé of the development of medical and sanitary knowledge and science. The preface states that the book is meant as a useful introduction to preventive medicine. This may account for the rather brief and rather superficial treatment of the subject matter. Rickets for instance is stated to be due to a diet deficient in vitamin A, while vitamin D is not mentioned in connection with rickets at all and no recent work on A and D is quoted. It is a pity there is not more uniformity in the nomenclature of the typhoid group. The paratyphoid bacillus B is stated here to be "frequently present in the intestines of normal animals, especially pigs, and can therefore often be found in meat products." This is not in accordance with English findings on paratyphoid B. The book is very readable and will be an excellent student's handbook, especially in the United States, though it will be interesting to all.

A. D. S.

ELEMENTS OF HYGIENE AND PUBLIC HEALTH.—By Rai Bahadur J. P. Modi, L.R.C.P. & S., L.F.P.S., with an introduction by Lt.-Col. E. J. O'Meara, F.R.C.S., D.P.H., I.M.S. Third Edition. Revised and Enlarged. Calcutta: Butterworth and Co. (India), Ltd. 1928. Pp. XIV plus 645, with 74 Illustrations. Price, Rs. 6 net.

THIS is a book on hygiene and public health of a type of which in India there are now several available for

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Arcanol

Schering

AGAINST

Influenza

Arcanol is composed of aceto-salicylic acid and the methyl ester of Atophan. It possesses in a high degree the well-known anti-infectious and antifebrile virtues of aceto-salicylic acid as well as the far-famed antiphlogistic and anti-rheumatic qualities of Atophan. These properties signalise Arcanol as the remedy par excellence against influenza and its complications, angina, catarrhal affections of the upper respiratory tracts, scarlatina, etc. It will be found most convenient to administer Arcanol in daily doses of from 3 to 4 tablets after meals. Original packing: Tubes containing 10 tablets of 15 grains. Samples and literature will be gladly sent to medical men on application to:

SCHERING-KAHLBAUM (INDIA), LTD. CALCUTTA

Telephone: Cal. 4770
Telegrams Aeskulap
4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

2044501 **F. SCHWERZMANN & CO.,** Rangoon (Burmah): 26, Merchant Street.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

You certainly want

ONLY "BAYER'S" ASPIRIN

is broken up by the alkaline intestinal secretion instead of by the acid stomach juice ---- and therefore preferred by the medical profession.

BAYER

"BAYER'S" ASPIRIN

(1) is only supplied by one firm.

(2) is always identical.

(3) has always the same melting point and is always of the same purity.

ASPIRIN

Literature and full particulars on application.

HAVERO TRADING CO., LTD., CALCUTTA,

Pharmaceutical Dept., *Bayer-Meister-Lucius*

P. O. Box No. 2122, 15, Clive Street, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

medical students. That is it in its third edition testifies to its popularity and acceptance amongst the medical students for whom it is written. It has the defects of these qualities, in that it is written to a syllabus. The teaching of public health to the Indian under-graduate is not an easy matter. It is a point of view that one wishes to inculcate rather than a few facts about water supply, refuse disposal, and ventilation. This can be done only by the whole body of teachers, and not by Professors of Hygiene alone, by practical demonstration of the application of the principles of preventive medicine in the everyday life of the town and state. This latter is so deficient in India, and the general practitioner is called upon to play such a negligible part in preventive medicine, that it is not surprising that the syllabus of hygiene in our schools and colleges should be so restricted and defective, since they must of necessity reflect in some measure the state of the public health opinion of the country.

With these reservations, however, Dr. Modi's book is a good one. It contains all that the student will require to know for his examination. While there is much that is new, we think Dr. Modi might have missed out much that the non-discriminating student learns by rote and writes as knowledge—the A.B.C. process, the amines process, Jenning's inlet, Stevenson drawer, Hatton's hopper ventilator for instance only uselessly clog the memory of the student. We would have preferred the subject of ventilation to have been treated in a fresher and more up-to-date manner. The kata thermometer is described under meteorology and not mentioned under ventilation. The importance of the physical condition of the air, though mentioned, is not sufficiently insisted on. The illustrations of the ventilation of a large hall is one of the "cold feet and hot heads" systems which has been said to account for the poor quality or much legislation in the past. There is much new matter in every chapter and the author has evidently taken great pains to incorporate essential matter pertaining to Indian conditions and diseases published during the last few years. The chapters on plague, village sanitation, and the sanitary arrangements at fairs and *melas* are quite good, though it is rather startling to find that fleas can "fly."

The illustrations are smudgy and disappointing. The "*B. pestis* in the human blood" and "Anopheline eggs" might be anything; the pictures of an "Anopheline" and a "Stegomyia" seem to have got transposed and in any case are not good representations of the actuals. We often insist that textbooks for under-graduates should contain only definite facts and not loose statements which may be memorised and mistaken for fact. The author states that "the embryo and eggs of the following parasitic worms are often found in water and may be taken into the stomach of man.....*Filaria sanguinis hominis*....."

The book will doubtless find many readers amongst under-graduates and students preparing for their examination in hygiene.

A. D. S.

THE WORK OF MEDICAL WOMEN IN INDIA.—By M. I. Balfour, C.B.E., M.B., C.M., and R. Young, M.B.E., B.Sc., M.B., Ch.B. With a foreword by D. Mary Scharlieb, D.B.E., J.P., M.D., M.S. Humphrey Milford. Oxford University Press: Bombay, 1929. Pp. XIV plus 201, with 15 illustrations and 1 map. Price, Rs. 6 net.

"THE work of Medical Women in India" by Dr. Margaret Balfour, and Dr. Ruth Young, recently published by the Oxford University press and with a foreword by Dame Mary Scharlieb, one of the pioneers of Women's Medical work, contains a most vivid and interesting account of the endeavours made by women to establish medical relief for the women of India, of the difficulties they met with and overcame, of the sympathy and support forthcoming from many sources in India, and of the great growth of and the scope for the work at the present time.

The apology contained in the preface: "Lastly we would ask our readers to remember that the book has been written in the intervals of our work, during week-ends and on journeys, and finally completed during our not very lengthy furlough" suggests more than any references to their own work in the book (for in it we find almost none), something of the debt which women's medical work owes to those two authors, whose efforts in organizing the women's medical service as it is to-day, have been so untiring and so constant. The opening chapter dealing with the field of work gives a very clear and concise account of some of the causes and customs so widely spread in India which led to the need for medical relief being commenced and carried on among the women of India in zenana hospitals. The difficulties of the young Indian medical women are also discussed; how often they have had to meet trouble with family or social objections; how sometimes they have to conquer their own caste prejudice and natural diffidence, and accustom themselves to appear publicly, how they have to carry on their medical study in another language than their own and one usually acquired after childhood is passed.

The work of the pioneers is also of exceptional interest and there is a very clear and connected account of the reasons which called for the start of their work, of their early recognition of the call for service, their overcoming and meeting the problems both of obtaining training for themselves and then of staffing and equipping hospitals and training schools for women.

The history of the Countess of Dufferin's Fund and the subsequent efforts of various Vicrenes and of the practical support of the Indian Government and of private individuals is very well told, and shows how the value of the work of these medical women, and the need for it became more widely recognised, and how the organization became more widespread. The mistakes and shortcomings made in the early days are discussed with great candour and even emphasised, and also the efforts to improve the status of medical women.

The chapter on Women Medical Missionaries is full of sympathy with and insight into their work, past and present, and some interesting problems are put forward which are likely to affect them in the future, also of how they are devoting more attention to preventive medicine and Child Welfare work than in the past years.

The scope of the present day work is told of in the later chapters, general medical practice, the medical education of Indian women with the commencement of medical schools and colleges exclusively for their training, and of the great field of preventive medicine which is opening up branches of such particular interest to women workers, namely, maternity and child welfare work and medical inspection of school children.

Finally, there is a short account of research done by medical women in connection with childbirth and infancy and in it a note of regret is expressed that this research has been so limited considering the ideal conditions for it and the amount of material at the disposal of the workers, but with fairness pointing out the impossibility of both coping with the practical hospital work, with limited staffs and limited means preventing employing more, and also giving adequate time for research as well.

The whole book is not a long one, but its contents are so well thought out and the description of problems of the work so carefully considered, that besides being of much historical interest it is of great practical value to all those who have the health and welfare of the women of India and the future generation of the country at heart.

M. C.

MODERN PHARMACOLOGY AND THERAPEUTIC GUIDE.—By A. R. Majumdar, M.B., Bengal Medical Service, Teacher of Materia Medica and Physician, Campbell Medical School and Hospital, Calcutta. 1929. Pp. 540. Calcutta, The Book Co., Ltd., Price, Rs. 4-8.

IT is becoming increasingly clear that the needs of the Indian medical student for cheap, yet accurate and reliable textbooks is being realised. We have previously reviewed the author's *Bedside Medicine* favourably, and may here say that we consider this companion volume to be equally good. In a foreword, Lieut.-Col. R. N. Chopra, I.M.S., Professor of Pharmacology, Calcutta

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

School of Tropical Medicine, writes that "the book is intended to be a stepping stone to the more detailed study of pharmacology. The author has certainly succeeded in his object and has put before the student in clear and concise terms the main actions of the important drugs and their therapeutic uses."

In brief, this volume is an Indian medical student's and practitioner's "Hale White." It is a summary of the author's lectures to students of the Campbell Medical School, Calcutta, studying for the L.M.S. qualification of the State Medical Faculty of Bengal. These students finish their medical curriculum in four years, of which the first two are devoted to pharmacology and materia medica among other subjects. They therefore require a textbook which shall be relatively simple, yet reliable, and suitable for everyday use.

The arrangement of the book follows upon the lines usual in such works. Successive sections deal with the inorganic pharmacopœia, vegetable products, animal products, a synopsis of pharmacology—outlining the general groups of drugs and remedies—; materia medica, pharmacy, incompatibility, a therapeutic and a general index. Throughout the book footnotes on almost every page give prescriptions and this lends a specially added value to the book, for they will prove very useful.

The publishers have carried out their work well, and the book is pleasingly free from misprints. It is of a convenient size and well printed—the use of leaded type serving to bring out the most salient points.

We are glad to welcome this book as one which is almost certain to appeal equally to the medical student and the general practitioner in India. It is well designed, well put together, and well published. It is an interesting example of progress in medical education in India.

R. K.

THE MEDICAL MUSEUM, BASED ON A NEW SYSTEM OF VISUAL TEACHING.—By S. H. Daukes, Director, The Wellcome Museum of Medical Science, Size 10" × 7", Pages 172. (The Wellcome Foundation Ltd., Endsleigh Court, 33, Gordon Street, London, W. C. I.)

THIS book is not merely a theoretical contribution to the improvement of museums in general and medical museums in particular, but a description of practical achievement based upon theory and vision.

The author is precise, clear, and has obviously devoted much study, skill and care to a subject in which this book stamps him as an expert. Having in the first chapter discussed the functions of a medical museum and made a plea for reform and for a wider outlook, Dr. Daukes proceeds in subsequent chapters to describe and discuss the details of the new system of visual teaching on which the ideal medical museum is based.

This is followed by appendices dealing with the application and development of the system, with types of buildings, walls, screens, cases, labels, illustrations and technical details of preserving and mounting specimens. In conclusion there is a very valuable and complete bibliography of technical museum publications and 45 whole-page illustrations of screens, sections and specimens which are most helpful as providing practical evidence of the soundness and practicability of this new system of visual teaching.

The volume is most admirably printed, bound, illustrated, and got up.

The letterpress is in large, easily read type and the typography gives an air of distinction to the publication which is further enhanced by the technical perfection of the photographs of difficult subjects and the high quality of the half tone reproductions.

Everyone interested in museums, whether in regard to construction, development, control or use, should read and study this book. Having done so there will be a natural desire to see its methods developed in actual practice, which, fortunately, is possible for all those who can visit The Wellcome Museum of Medical Science, 33, Gordon Street, London, of which Dr. Daukes is Director.

Annual Reports.

REPORT ON THE ADMINISTRATION OF BENGAL, 1927-28. CALCUTTA, BENGAL SECRETARIAT BOOK DEPOT, 1929. PRICE, RS. 6.

Climatic conditions and their effect on public health.—Even the slight departure of actual rainfall from the normal that occurred during the monsoon season of the year under review was not without its effect on the general public health of the province. The incidence of cholera and smallpox was practically double that of the previous year, while slight increases were noticed in dysentery, diarrhœa and respiratory diseases. Deaths from fever and all other causes, however, showed some improvement.

Vital statistics.—The very slight increase in the birth rate over that of the previous year and its attendant rise in the death rate points in the same direction. The net result of these two rates, as shown by the natural increase in the population, is very disappointing. It was 4.4 per mille in 1923, 3.6 in 1924, 4.7 in 1925, 2.7 in 1926 and 2.1 in 1927. Bengal has thus been standing last on the list for the last two years as compared with the other provinces. Its birth rate in 1926 was higher than Burma alone and the death rate lower than Bombay, Punjab and the Central Provinces. Again, all the other provinces except the Central Provinces and Burma had a lower rate of infantile mortality than Bengal. Although there was an increase of births over deaths in 20 of the districts of Bengal, this was more than counterbalanced by the prevalence of deaths over births in the remaining 6 districts—Hooghly, Howrah, 24-Parganas, Jessore, Khulna and Bakarganj, all contiguous to one another.

Epidemic diseases. Cholera.—Cholera and smallpox again reappeared this year in a more virulent form than in the previous one. The death rate from cholera increased by 92.3 per cent. compared with the previous year and the decennial mean; it practically rose to the same height as it did in 1919. The percentage of cholera deaths to total mortality was higher than it had ever been during the last 20 years. About 22 per cent. of the total number of villages in the province were affected. Starting on its upward trend in December 1926, it continued with fluctuating intensity till May, when it declined. It again became very virulent towards the latter part of the year. Practically all the districts were affected except Jalpaiguri and Darjeeling which escaped lightly, Malda being the worst sufferer. Had it not been for the timely vigorous measures adopted by the local bodies in co-operation with the Public Health Department, it would have undoubtedly fared worse with Bengal. The anticholera inoculation, which has already established its reputation in the previous years, proved, as usual, extremely efficacious in controlling local outbreaks. About two and a half million cubic centimetres of the vaccine were issued and nearly two million inoculations were performed. Again 39,356 wells and 33,550 tanks, in addition to a number of river ghats, were disinfected by the local sanitary staff, besides 3,592 wells, 1,235 tanks and 504 latrines done by the staff under the Public Health Department. The local sanitary authorities also undertook disinfection of the infected houses and of the patients' clothes wherever possible. The Public Health Department co-operated by making a free supply of disinfectants to the local bodies and placing at their disposal the services of 100 Sanitary Inspectors and 20 Sub-Assistant Surgeons sanctioned temporarily by the local Government in addition to those of their permanent medical staff. Special watch was maintained over pilgrims for Puri Rathjatra and Gangasagar festivals. The Publicity Department arranged for the distribution of posters, lectures and magic lantern demonstrations to enlighten and educate the public on the preventive measures essentially required to be adopted in this connection.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

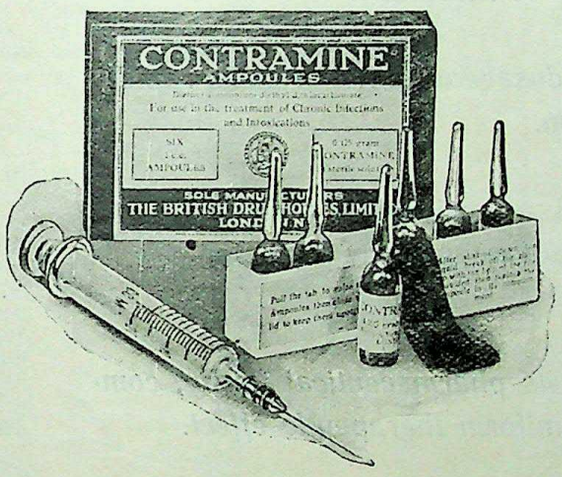
CONTRAMINE

and

Thio-histamine

The value of Contramine in cases of gonorrhœa with chronic complications has led to the recognition of this drug as one of the best means available for combating all types of chronic gonococcal infection.

Contramine is also of remarkable value in cases of rheumatism, arthritis and fibrositis even when not of gonococcal origin.



Contramine is supplied in ampoules which contain the drug in sterile, aqueous, isotonic solution ready for intramuscular injection; it is issued also in pessaries for the treatment of gonorrhœa in women.

Thio-histamine is similar to Contramine in pharmacological and therapeutic effects but is quicker in action. Thio-histamine is for use in acute cases, Contramine being more valuable in chronic conditions.

Descriptive literature, including interesting clinical reports, will be sent on request to either of the B.D.H. resident representatives:

HENRY S. CLARK,
8/10, Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Bldgs.,
Parsee Bazar Street,
Fort, BOMBAY.

THE BRITISH DRUG HOUSES LIMITED
LONDON

Co/In/299

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TRADE **'EUKODAL'** MARK

Morphine Substitute

ANALGESIC and SEDATIVE

Equal in therapeutic value to morphine, its toxic by-effects are much less marked.

It may be given in all cases where morphine is indicated, in addition to which it is of peculiar value in cardiac disease. Habit formation develops much more rarely and much later than in the case of morphine.

The necessity for increased dosage does not arise as rapidly as in morphine administration.

Eukodal has attained a position of pre-eminence as a narcotic, advantageously replacing morphine.

Eukodal is distinguished by its pharmaceutical purity, comparatively low toxicity and uniform therapeutic effect.

PACKING: Tablets 0.005 gm. tubes of 10 and 20
Ampoules of 0.01 gm. in 1 c.c. Boxes of 5 and 10
Ampoules of 0.02 gm. in 1 c.c. Boxes of 5 and 10

E. MERCK CHEMICAL WORKS **DARMSTADT** (GERMANY)

Represented by Messrs. MARTIN & HARRIS Ltd., CALCUTTA, BOMBAY, MADRAS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It was with the help of these measures that cholera epidemics were kept within proper control.

Smallpox.—The quinquennial outbreak of smallpox which started towards the end of 1924 entered upon the fourth year of its existence during the year under review, and it seems that by the end of the year it had not spent its force. In fact, it appears more than probable that it will finally merge in the pandemic forecasted to appear about 1930-33. Its virulence is shown by the fact that the death rate in 1927 exceeded the previous year's rate by 80 per cent. and the decennial mean by 200 per cent. It was ten times higher than what it was in 1923, which was a normal year. The death rate was practically doubled in all the other towns and trebled in Calcutta. The urban rate exceeded the rural by about 70 per cent., thus proving that smallpox is more particularly a disease of the towns than that of the villages. A little over 10 per cent. of the total villages in the province were affected, indicating the widespread nature of the epidemic. The age distribution is very interesting. About a quarter of the total number of deaths appear to have occurred among infants and children below 10 years of age and the remaining three-fourths among age periods above 10, thus emphasising again the necessity of repeated revaccinations as soon as the effect of a previous vaccination has worn off, which it gradually does from 5 to 7 years. With the exception of Darjeeling, Jalpaiguri, Khulna, Bakarganj, Bankura, Rajshahi, Jessore and Nadia, which suffered comparatively lightly, all the other districts were more or less seriously affected, the main brunt being borne among others by Midnapore, Murshidabad, Calcutta, Pabna, Bogra, Rangpur and Malda. The Malda epidemic deserves more than a passing notice. The outbreak first made its appearance towards the middle of November 1927, and very soon became widespread, so much so that before the year was over it had affected about 12.7 per cent. of the villages in the district and claimed 1,537 victims. Its virulence can be judged from the following statement showing its weekly progress for 18 weeks from its commencement:—

Week ending—	Cases of smallpox.	Deaths.
January 7th, 1928 ..	157	21
" 14th, " ..	158	32
" 21st, " ..	249	45
" 28th, " ..	111	36
February 4th, " ..	278	64
" 11th, " ..	367	52
" 18th, " ..	298	94
" 25th, " ..	314	66
March 3rd, " ..	479	89
" 10th, " ..	286	64
" 17th, " ..	378	80
" 24th, " ..	380	78
" 31st, " ..	390	64
April 7th, " ..	819	165
" 14th, " ..	831	189
" 21st, " ..	575	140
" 28th, " ..	398	115
May 5th, " ..	387	86

A campaign of mass revaccination was immediately started, with the active co-operation of the energetic District Magistrate, Mr. J. Peddie, I.C.S., and up to the present nearly half a million vaccinations have been performed. In addition to the district board expenditure, the local Government have contributed Rs. 6,800 towards meeting the cost of the campaign which is still going on. This campaign by its results has conclusively justified the belief that if timely measures are taken, it is reasonable to expect a complete control of smallpox outbreaks before they assume epidemic proportions. Warned by the Public Health Department from time to time and guided by their own previous experience, the District Health Officers have not been slow in starting mass revaccinations in many of the affected districts; in fact, the process has been continuously going on ever since the present quinquennial outbreak started. From 2,057,724 vaccinations in 1923-24, the number has risen to 3,975,837 in 1927-28, and this reflects great credit on the activities of the local bodies. Going still further back, it is observed that the number of vaccinations during the last 20 years has increased by 109.5 per cent. and this increase has especially been marked since the transfer of the rural vaccination affairs from the Civil Surgeons to District Health Officers in 1921. Some of the districts, e.g., Pabna, Malda, Murshidabad, Dinajpur and Darjeeling, in fact have more than trebled the number of vaccinations during this period. But in spite of their best efforts, the District Health Officers feel that their work is extremely hampered by the absence of compulsory legislation to enforce revaccination and by the law's delays according to the present procedure of dealing with the offenders. The Government as usual contributed Rs. 50,000 during the year for promoting free vaccination; the expenditure of the district boards as a whole for this purpose was also considerably increased as compared with the previous years.

Malaria.—The death rate from malaria further decreased during the year, the trend still continuing on the decline Even so, it accounted for 36.1 per cent. of the total mortality in the province. Judged from the total admissions from this cause to the various medical institutions, the number of cases began to increase gradually from July till it reached its maximum in November. Nadia and Burdwan with a mortality of over 50 per cent. were the worst sufferers, while Dacca, Tippera and Bakarganj escaped very lightly with a rate below 10 per cent. The death rate in rural areas was a little over 5 times of the urban rate. The diminished incidence of malaria was responsible for a reduced consumption of quinine by 1,227 lbs. as compared with the previous year. The other anti-malarial activities consisted in the experimental schemes at Banka Valley, Jangipur, Singaran, Toposi, Meenglas and Krishnagar, which were continued during the year. A number of anti-malarial co-operative societies, some recently established and organised, the kala-azar centres and the district board dispensaries, in addition to distributing quinine, treated these cases also, while the former in addition carried out minor anti-malarial operations.

Kala-azar.—Kala-azar mortality showed a decline throughout, the death rate being reduced by 19.4 per cent. for the province, 27.4 per cent. for the towns and 14.3 per cent. for the rural areas compared with the previous year. In Calcutta the decrease was 15.6 per cent. Thus, the improvement started in the previous year was maintained during the year under review. Rajshahi, Nadia, Jessore and the 24-Parganas returned the highest death rate, while Birbhum, Bankura and Midnapore were practically free. Kala-azar cases treated at the various dispensaries and special treatment centres, however, showed an increase in 19 districts over the preceding year and a reduction in the remaining 8. This increased attendance shows the anxiety of the people to get themselves cured of the disease, which their own experience has shown them to be amenable to the latest method of treatment. The Government contributed a sum of about Rs. 2 lakhs during the year for stamping out kala-azar, and with the help thus received the district boards were able to maintain 964 special treatment centres during the year. Of these, 69 are being run by voluntary public health agencies, e.g., the Central Anti-malarial Co-operative Society and Bengal Health Association.

Other epidemic diseases.—Filariasis is reported by the District Health Officer, Bankura, to be spreading in his district, where some of the villages in the Sadar subdivision are said to be full of lepers. About 50 per cent. of the people in the Sariakandi and Dhunat police-stations in Bogra district are stated to have enlarged thyroid. Cases of epidemic dropsy have been noted in Bakarganj and Faridpur districts.

General.—The amount of school hygiene work done by local bodies in the mufassal during the year surpassed all past records. The Vishva Bharati at

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Santiniketan (Bolepur) in the district of Birbhum, the Karapara High English School in the Khulna district, the Shyamagram High English School in the Tippera district and the Burdwan Raj School at Kalna in the Burdwan district, initiated school hygiene work in their institutions through registered medical practitioners, and the District Board of Hooghly and the Municipalities of Chittagong, Krishnagar, Serampur, Nabadwip and Hooghly-Chinsura through their respective Health Officers. One hundred and ninety-six schools and 11,746 boys were examined by the officers of the Bengal Public Health Department. The Assistant Director of Public Health in charge examined 131 plans and reviewed 2 books on Hygiene.

Grants were made to the various local bodies for *dai*-training. Altogether 1,170 *dais* were thus trained in 104 classes started by 49 local bodies and one health society. It is expected that if this rate is maintained, the infant mortality will, in course of time, be greatly reduced.

The Publicity Bureau of the Public Health Department has come to be recognised as an institution of national importance, judging from the gradually increasing and pressing demands for its officers and materials by all classes of public bodies, irrespective of party denominations. Three hundred and forty lectures were delivered and 131 bioscopic shows given by the officers of the bureau during the course of the year. As a result of this educative campaign, 35 health exhibitions and 32 baby shows were organised during the year compared with 10 exhibitions and 20 baby shows held during the previous year. Mention may be made in this connection of the Eastern Bengal Railway demonstration train, organised as the result of a suggestion made by the Public Health Department. No less than 186,000 people visited the demonstration health car. A series of health lectures was delivered to the prisoners in the Central and Presidency Jails at Calcutta. Sixty-one sets of multi-coloured magic lantern slides were designed and prepared by the Publicity Branch during the year, in addition to two films on maternity and child welfare.

Rural public health organisation.—The summary would be incomplete without special mention being made of the rural public health organisation scheme. This scheme came into operation during the month of August 1927, when 138 rural health circles, each corresponding with a police thana unit, were started. Each circle was placed in charge of a staff consisting of a rural Sanitary Inspector, a Health Assistant and a carrier directly under the control and supervision of the District Health Officers. With the increase in the number of available Sanitary Inspectors, the number of health circles rose to 258 during the year. The total number of health circles admissible under the scheme for the whole province is nearly 600. The officers in charge of the health circles being responsible for the entire epidemic work including vaccination in their respective jurisdictions, the existing staff of Vaccination Inspectors and Sub-Inspectors are being gradually absorbed in the rural public health establishment, and as such will finally have no independent existence.

GOVERNMENT OPHTHALMIC HOSPITAL, MADRAS. ADMINISTRATIVE REPORT, STATISTICS AND PROFESSIONAL REPORT FOR THE YEAR 1928. BY LIEUT.-COL. R. E. WRIGHT, M.D., C.I.E., I.M.S. MADRAS: SUPERINTENDENT, GOVERNMENT PRINTING. PRICE, RS. 2.

COLONEL WRIGHT'S annual reports are very different from the usual type of annual report which we are called upon to review, for they are full of interesting and important matter. In fact we cannot conceive of more information for Rs. 2—the price of the report—anywhere. The medical man who practises eye work in this country should undoubtedly purchase it annually. (We write this not to push the sale of an official publication, but solely in the interest of our readers.)

The report for 1928, as usual, is divided into a long and interesting professional report, tables of statistics, and a short administrative report. Colonel Wright has much to say about the important question of preventable blindness in India, and this is dealt with in the editorial for this month, so that only the rest of the report remains for review.

No less than 25,282 out-patients and 3,936 in-patients were treated during the year; the average daily totals dealt with being 253.9 for out-patients and 247.7 for in-patients.

Cataract is the first subject dealt with. Here Colonel Wright is very emphatic. Operative work on cataract seems to be an obsession with a high percentage of ophthalmologists in India. They will neglect the emergencies of ophthalmology, the acute glaucomas, the hypopyon ulcers, and the causes of preventable blindness, such as keratomalacia, and endeavour to establish a reputation as cataract operators. They will rush into print with trivial and unimportant articles. Ophthalmic surgery in India appears to mean cataract operation and nothing else to far too many medical men in the country; the real science of ophthalmology is neglected and the opportunities for scientific investigation missed. Further, far too many men carry out cataract operations who are not competent to do so, and add their dozens or hundreds to the cases of preventable blindness in India.

The Madras practice in cataract operation is substantially that described in Colonel Kirkpatrick's small textbook, but naturally many changes in procedure have crept in during the past ten years. Nearly all the patients get novocaine blocking of some sort, 7th nerve, ciliary ganglion, circumorbital muscles, or local infiltration of the levators. Control of the lids after the operation by means of sutures is at present in vogue, but some simpler and better method remains to be devised. Anyhow the old days when the patient was seriously able to interfere with the operation by squeezing the lids together are gone.

The second big step forward in cataract operation is the necessity for some simple, quick and efficient method of maintaining the lips of the section together as the last step in operative technique. What amounts to twilight sleep may have to be administered to troublesome patients; blocking of the 7th nerve was employed in 508 cases and deep orbital or ciliary novocaine injections in all Barraquer cases, and in practically all cases where it was desirable to obviate pain. Bridge flaps are unsuitable owing to the special tendency to hæmorrhage in Indian patients. This method was tried out on an extensive scale during the year and every type of flap resorted to, the method being tested in 617 cases during the year. But the method increases the time taken over the operation, the lens matter does not come away as cleanly as it does without a flap, and blood clot under the flap is a bugbear. The irrigator is here of great help, and should be resorted to. But bleeding is a serious matter in Indian patients, not only at the time of operation but afterwards from the tendency for pigmented fibrous bands to form. Arteriosclerosis of old age is an element in the causation of this tendency to bleed, but is not the only factor. Hypo-adrenia may be a factor, but theorising does not help in the operating theatre. For the present Colonel Wright proposes to retain bridge flaps until he evolves something better.

The iridectomy adopted is nearly always a peripheral button-hole. Cases in which the pupil will not dilate with free instillations of cocaine, atropine and homatropine are often associated with central or peripheral posterior synechiæ. These and others with frank old standing iridocyclitis are better dealt with by a complete iridectomy. For opening the capsule needling has always been the method adopted in Madras, but one wants something better, some method of removing the whole of the anterior capsule. During the year a method was adopted by which a flap of the anterior capsule is formed with its hinge below, this flap being torn off before or after delivery of the lens.

The question of intra-ocular pressure in the posterior segment during operation was investigated in a large number of cases. The majority of cases operated on in India are old patients with loss of elasticity in the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOVRIL in INSOMNIA

Writing in the "Lancet" of October 8th, 1927, a London Nerve Specialist says:

> *"It is unwise to go to bed on an entirely empty stomach, since it is generally accepted by physiologists that cerebral anæmia plays some part in the mechanism of sleep A meal tends to produce drowsiness . . . (compare the desire of most animals to sleep following a meal)."*

He goes on to recommend, *inter alia,* a cup of Bovril and biscuits half an hour before bedtime. Bovril provides the required sustenance in a simple, palatable, and easily digestible form, thus predisposing the system to sound, healthy sleep.

BOVRIL Limited cordially invite any medical man visiting England to inspect their factory at any time. 146/166, Old Street, London, E.C.1.

BOVRIL

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A WORTHY PRODUCT

IMPORTANCE OF BOWEL CARE

In the treatment of constipation in any of its various forms, there is nothing having a wider range of practical usefulness than 'Petrolagar'. It is compatible in any systemic treatment.

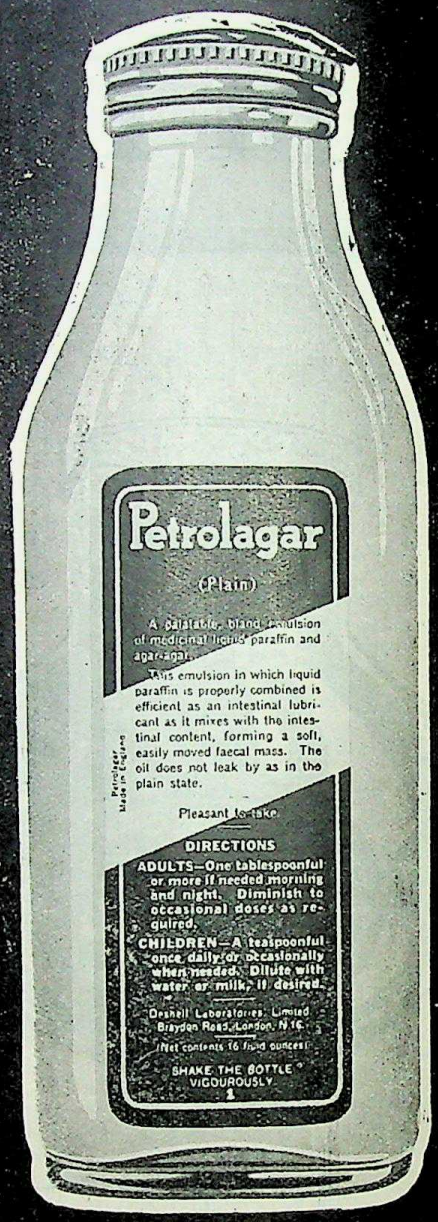
'Petrolagar' is not a cathartic, it is entirely mechanical in its action and relies on its high oil content for its efficacy. Many imitations are made to look and taste like 'Petrolagar,' but rely for their action on purgatives contained in their composition—examine the formula of preparations before prescribing them.

Send to :

H J. FOSTER & CO., LTD

P. O. Box 202, Bombay,

for free copies of interesting literature.



Petrolagar Alkaline is specially valued in the Tropics as by its bland and mildly alkaline action it allays inflammation and has a soothing effect on the bowel. The oil present is not absorbed, therefore it is not heat producing. Petrolagar is manufactured by a special mechanical process which requires no handling.

Petrolagar

REGISTERED TRADE MARK

'Petrolagar' is the trade mark distinguishing the fine emulsion of mineral oil and agar. Four varieties: Plain, with Phenolphthalein, Alkaline and Unsweetened, manufactured only by Deshell Laboratories, Ltd., London, N.16.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

muscles and a diminution of fluids in the tissues of the orbit and globe—"withered eyes" in fact. Anchoring of the globe otherwise than by a tangential force raises the intra-ocular pressure and causes the lips of the section to gape. The various hooks and forks used in this connection are unsatisfactory; if the patient can be made to look steadily downwards (and with nerve block this is secured more readily than without it) the operation proceeds satisfactorily. "The comfort of operating on a patient who can bring no muscle power to bear, either circumorbital or orbital, and who cannot feel, would be appreciated by those who have to operate on patients such as we sometimes deal with." Intra-ocular hæmorrhage is still a further factor in raising the intra-ocular tension.

The state of the vitreous, rather than muscular action, would appear to explain the tendency of the corneal section to gape in some patients. In 164 such eyes the tension was normal or subnormal in 158. In certain pathogenic states the vitreous appears to be increased in volume, whilst the state of turgescence of the choroid is also important. The reverse condition, where the eye is sunken, and on removal of the lens the iris drops backwards, is apparently due to an essential shrinkage of the vitreous. Of 1,187 eyes operated on in connection with which the posterior segment pressure was observed 214 were normal, 412 showed an increased intra-ocular pressure, and 561 diminished pressure.

The vitreous loss rate for all types of cataract and all operators in the hospital is low, 1.87 per cent.; for straightforward capsulotomy 0.75 per cent. This improvement on the previous records Colonel Wright attributes to the nerve-block methods of control which he now uses so extensively. The iris prolapse rate for all cases was 1.39 per cent.; for straightforward capsulotomy 1.16 per cent.; and of 1,314 straightforward capsulotomy cases operated on by Colonel Wright and Dr. Nayar Avargal, D.O.M.S., the vitreous loss rate was 0.61 per cent. and iris prolapse rate 0.97 per cent.

"Safety first" in brief is the motto of the Madras School with reference to cataract extraction (and we could wish that other operators in India would adopt it). Each case must be studied on its own merits, and mass operations are rather a mistake. A single morning may exemplify practically every well-known device for aiding the extraction of the cataractous lens.

Patients for the Barraquer operation have to be very carefully selected. It is more suitable for the sunken than for the bulging type of eye. In the former class of case, subsequent to the iridectomy, the chamber is filled with saline. In the latter, the trouble is that the vitreous tends to follow the lens and push the iris forward with it. The method is especially suitable for immature cataracts, where the patient from economic reasons desires early operation rather than to wait for ripening of the lens.

On p. 10 of the report a most interesting table is given of the methods of cataract extraction used during the year; of a total of 1,870 cases, 1,460 were dealt with by capsulotomy, 6 by the intracapsular operation, 243 by Barraquer's method of phacoerisis, 2 by linear operation.

Glaucoma forms the second subject dealt with in the report. During the year a clinical investigation was carried out into the different non-operative methods of treatment of primary glaucoma, each case being dealt with in accordance with a definite plan of examination. The total number of cases of which such a record was kept were 100. These cases fall into two main groups, congestive or non-congestive, i.e., posterior segment types, or anterior segment types. In the former the important factor is the increase in bulk of the vitreous which pushes the iris forward. In these, cupping of the disc may not take place until quite late in the history. In the anterior segment type of case there is chronic glaucoma with a normal chamber, an iris in the vertical plane, and deep cupping. Investigations were carried out with regard to biochemical examination of the blood of the patients, the presence or absence of syphilis, the general blood-pressure, intra-ocular tension, and other factors. "From a clinical point of view there was nothing to distinguish our glaucoma cases from our non-glaucomatous cases except the local changes." A large number of empirically suggested drugs were tried; intravenous iodine, intravenous hypertonic saline, intravenous injections of sodium sulphate, drugs applied locally and others taken by the mouth. The results were poor; intravenous injection of hypertonic saline (30 per cent.) and sodium sulphate (30 per cent.) will bring the increased intra-ocular pressure down with a sudden drop, but it rises again within the next 6 to 8 hours. Eserine and local adrenalin pack may be helpful in bringing the patient into a far better condition for operation than he would be without them. In one case homatropine, used as a means of diagnosis, produced a rise which was uncontrollable by any means except intravenous hypertonic saline.

Sclero-corneal trephining remains the sheet anchor in the treatment of glaucoma, and was adopted in 92 cases as against 21 treated by other methods of decompression. Anterior segment cases are easier to handle than posterior segment types.

Refraction.—In the refraction rooms 2,392 cases were dealt with. "Bifocals" are extremely popular in Madras; even bifocals of plain glass! Although the ordinary patient usually goes to the bazaar to have his refraction tested, yet the pressure on this department is so heavy that the refraction room has been so increased in size as to allow six in place of three assistants to do routine examinations.

The professional part of the report contains, as usual, a number of selected and interesting case reports. For these we must refer our ophthalmological readers to the original report itself. Two cases of angiomatosis retinæ were observed, and ten cases of brain tumour or allied conditions. A case of cystic tumour of the hypophysial region is illustrated by a photograph and skiagrams. Another very interesting case was one of internal hydrocephalus in a male of 19, following syphilis, with extensive pressure markings on the floor of the anterior fossa.

The report then goes on to deal with the principal diseases seen in out-patients. Here catarrhal conjunctivitis (5,820 cases), Koch-Week's conjunctivitis (2,045), and angular conjunctivitis (856), head the list. Then follow superficial punctate keratitis (801), ulcers of the cornea (746), phlyctenular conjunctivitis (762), trachoma (642), and follicular conjunctivitis (284).

Trachoma is often misdiagnosed as such by the ordinary medical man. "Granular lids" is in reality no diagnosis at all; it may mean anything. The result, however, of such a universal diagnosis is the almost universal application of severely irritant treatment which may do untold harm to lids which, otherwise, might have recovered if left alone. An interesting case was one of possible trachoma where an intravenous injection of iodine was followed by acute iodism with a generalised rash; a month later the eye condition had completely cleared. Webster's operation is used in the treatment of entropion following trachoma. Enucleations and eviscerations are now done freely in the out-patient department under local anæsthesia, thus saving both time and beds.

The pathological department examined 74 eyeball specimens and 57 others. Blood specimens sent for the Wassermann test numbered 1,300, of which 328 were positive and 972 negative. Tumours and neoplasms constitute an interesting section of the work and several are here detailed; a melanotic sarcoma of the upper lid, a Meibomian carcinoma, a cavernous angioma of the orbit, a basal-celled epithelioma of unusual type, an epithelial tumour of the nose invading the orbit, an aneurysm of the orbit, and an angioma of the lid and anterior temporal region. A special study of lymphoblastoma of the orbit and allied conditions has been made by Colonel Wright, and an article dealing with this subject was published in the *Lancet* for the 19th January, 1929. Blood-pressure in the patients treated in the hospital is in general low, only some 50 per cent. having a systolic pressure of 120 and over. Glaucoma is not associated especially with an increased general

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

blood-pressure; and almost all of the really high pressures are associated with kidney disease and albuminuria.

The acquisition of a supply of radium by the local government enabled 11 cases to be treated up to the end of 1928. It proved of considerable value in a case of lymphoblastoma, but not as active in a case of glioma. Angiomata, rodent ulcer, orbital aneurysm, and localised carcinomata were treated by radium. Among interesting cases dealt with were a hypopyon ulcer due to a fungoid infection, and cataract in two sisters aged 3 and 8 years respectively. For leucoma tattooing with gold chloride was found inferior to Indian ink.

A special investigation carried out during the year was one into an epidemic of superficial punctate keratitis which commenced in May and lasted over into 1929. Over 800 cases were seen during this period. This appears to have been due to a filter-passing virus, and to be a condition similar to herpes febrilis. It is probably similar to the keratitis described by Herbert in Bombay in 1901, and that described by Kirkpatrick in Madras in 1920. Inclusion bodies appear in the corneal epithelium which very much resemble those characteristic of infections with the filtrable viruses.

Both under-graduate and post-graduate training in ophthalmology at Madras is considerably in advance of that at most English-speaking medical colleges. From sub-assistant surgeons to I. M. S. men are continually coming for training. New ophthalmic teaching centres have been opened up of recent years by the Madras Government at Vizagapatam, Calicut, Tanjore, Madura, and elsewhere, largely staffed by men trained at the Madras hospital. A licentiateship in ophthalmology has been established and is much sought after. The report includes a most interesting map showing the distribution of government ophthalmogical departments connected with schools or colleges, ophthalmological departments connected with missions, and the distribution of men with more and less than six months' training respectively at the Madras School, throughout the Madras presidency. No other province in India so far can show a similar map.

* * * *

The second section of the report is given over to statistical tables; a table of cases treated by radium; one of 500 blood-pressure readings arranged by ages and diseases; and then comes the administration report as the final section of the annual report. During the year 128 medical students and 72 post-graduate students received training at the hospital. The expenditure during the year on establishment, medicines and stores, diets, buildings, etc., came to Rs. 1,90,975. The year proved a most unfortunate one with regard to the staff. Lieut. C. G. Taylor, I.M.D., the resident medical officer, who had done duty for 17 years in the hospital had to take leave on account of ill-health and will not be able to resume his post; Assistant Surgeon V. G. Muttayya, who had served the hospital for 19 years died, and the loss of his valuable services is irreparable. Sub-assistant Surgeon A. K. Pillai, after 9 years service in the hospital, has been transferred.

Colonel Wright's report should be read in the original by everyone interested in ophthalmic work in India. It is too important a document to be regarded merely as an official publication.

ANNUAL REPORT FOR 1928 OF (I) THE NATIONAL ASSOCIATION FOR SUPPLYING MEDICAL AID BY WOMEN TO THE WOMEN OF INDIA (COUNTESS OF DUFFERIN'S FUND); (II) THE VICTORIA MEMORIAL SCHOLARSHIPS FUND; (III) THE LADY CHELMSFORD ALL-INDIA LEAGUE FOR MATERNITY AND CHILD-WELFARE. CALCUTTA: GOVERNMENT OF INDIA CENTRAL PUBLICATION BRANCH, 1929.

THESE three reports are incorporated in one volume. The first deals with the Countess of Dufferin's Fund and the Women's Medical Service in India. This records a rather disappointing year; not only was the proposal to increase the permanent Government of India yearly subsidy refused, but even temporary help in the form of non-recurring grants was refused; two vacancies could not be filled in in consequence and the W. M. S. doctor withdrawn from the Women's Hospital, Hyderabad, Sind. The Council feel so strongly the hopelessness of coping with the work of supplying well qualified women doctors in India without increasing aid from Imperial revenues that a memorandum on the subject was prepared and laid before the Indian Statutory (Simon) Commission in March 1929.

This memorandum (on p. 83 of the report) is one which should be read by every thinking medical man (and woman) practising in India to-day. It briefly sums up the history of the Women's Medical Service in India, its objects, its present, and its future. Provincial contributions have been exceedingly disappointing, and the income from central revenues is only Rs. 3,70,000. In conformity with the Lee concessions to other official services, in 1919 passage and similar concessions were granted to officer of the W. M. S., and a more liberal provident fund inaugurated (there is no pension in the service). The result was that in 1927, with a cadre of only 44, there was a deficit, and the cadre has now fallen to 42. But, as medicine is a transferred subject under the Montagu-Chelmsford reforms, the central Government consider that the expansion of the service is more a matter for provincial governments. It is estimated that at present about 400 women doctors with registrable qualifications are working in India; 42 in the W. M. S. and 15 in the junior branch of that service and its training reserve; about 90 under provincial governments and in local fund hospitals; about 150 under the different missionary societies, and some 100 in private practice. The female population of India is roughly 120 millions; and this provision works out at one qualified female doctor for every 300,000 of the female population of British India. Yet the purdah system is almost universal, maternal mortality is fearfully high, there is the urgent necessity for medical teachers into the diseases of women in this country, female medical teachers are demanded, and even in ordinary medical and surgical cases female patients refuse to be attended to by a male doctor. Thus the W. M. S. is in a most difficult position; with medicine a transferred subject, the Imperial Government clearly feel that they can do no more for it than they are doing already; whilst the Provincial Governments are too poverty-stricken to take up the matter. It will be interesting to see what the Simon Commission makes of this matter; to those who know India there can be hardly any subject more vital than the supplying of medical aid to the women of India by well qualified women doctors. It is not a mere matter of advisability, but of necessity; the W. M. S. has in it the seeds of a very important future organisation; at present, however, its work has to be cut down for want of funds. Here, surely, there is an opening for generosity on the part of Indian philanthropists. With the present grant-in-aid by the Imperial Government, supplemented by large donations by Indian princes and merchants who realise what the W. M. S. means, there might be created a body on lines similar to that of the Indian Research Fund Association, and with even wider facilities for useful work.

To return to the main body of the report, a second disappointment during the year was the refusal of the Rockefeller Foundation to give a grant towards research work on maternal and infant mortality. Her Excellency Lady Irwin, however, sent out a special appeal in March 1928, and a sum of Rs. 15,431 was collected. This enquiry of Dr. Balfour's at the Haffkine Institute, Bombay, has often been referred to in our columns, and it is satisfactory to note that the sum raised was sufficient to enable a second research worker (Dr. Christine Thomson) to be brought out from Home, whilst the Indian Research Fund Association has added a third worker (Dr. Lucy Wills) to the enquiry at the expense of the Fund. Thus this vital investigation has been strengthened, and its results should be of cardinal importance with regard to maternal and infant mortality

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

All the vitamins are present in

Glaxo

which can be prescribed with every confidence as the sole food for an infant from birth

"Extensive researches on the vitamin content of Glaxo show that Glaxo contains as high a content of vitamins A and B as fresh milk of good quality and almost as high a content of vitamin C."

BRITISH MEDICAL JOURNAL, *Jan 23rd. 1926*

Information and Literature gladly sent on request to :

H. J. FOSTER & CO., LTD., P. O Box 202, BOMBAY.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

IN PSORIASIS

A definite disappearance of the lesions in long-standing cases, with no recurrence after the lapse of twelve months, was reported in August 1927 by F. E. Ward, M.D., in *Medical Journal and Record.*

The only treatment given was the intramuscular injection of

THYMOCRIN

Since 1927 a very large number of cases of chronic psoriasis have received Thymocrin in Great Britain, Germany, and America, with results equal to those stated above. One typical report can be quoted here because it is brief:

> "I am pleased to report that the case of psoriasis is now completely recovered—after 20 years. He has been clear of any traces of it for the past six weeks, and up to the time of writing there is no sign of any recurrence—thanks to Thymocrin."

Further details as to dose, etc., will be sent on request. THYMOCRIN can be obtained, on prescription, through your usual chemist, or from

THE ENDOCRINE LABORATORY, SIMLA.

ENDOCRINES LIMITED,

WATFORD, HERTS, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

in India—(perhaps a more important problem than India's future political constitution of the defence of her frontiers).

During the year Dr. Mary O'Brien Beadon, W.M.S., was officially appointed to serve on the committee to consider the Age of Consent Bill now before the Imperial Assembly, a task for which twenty years of service in north India and the principalship of the Agra School of medicine for women specially fitted her. Many medical women in India, including members of the W. M. S. gave evidence before this committee.

"The universal cry from all W. M. S. doctors from Karachi to Calcutta," says the report, "is for more money to supply the barest necessities for their hospitals." Here we read that provincial governments, local bodies and the like take but a lukewarm interest in the institutions concerned and that "the Indian public will not give in charity to their support." (We wonder whether the last mentioned state of affairs cannot be remedied. Surely hospitals run by medical women for the women of India should be strongly supported by the Indian public. Indians are usually willing to give or bequeathe money to hospitals. The policy of fixing upon a sum of Rs. 500 to Rs. 5,000 to endow and name a bed, or of Rs. 50,000 to endow and name a ward was one of the most successful methods adopted by Sir Leonard Rogers in his up-hill fight for the Hospital for Tropical Diseases in Calcutta; and the ladies, with their free entry into the purdah, should surely be able to go one better. It is the personal touch that tells; letters are no use for raising money; a letter asking for an appointment and followed up by a personal visit often achieves the unexpected. The reviewer speaks from personal experience, for he once strolled down Clive Street after a morning of begging with cheques for Rs. 80,000 for the Carmichael Hospital for Tropical Diseases and the Calcutta School of Tropical Medicine in his pocket as the result of a morning round, and the promise of more to follow.)

Twenty-six scholarships were given during the year to lady students at the various medical colleges in India. Of the cadre of 41 officers in the W. M. S. at the end of the year, 19 had a European domicile and 22 an Indian domicile. "The Service has done good, steady and conscientious work during the year. In many hospitals doctors are fighting a difficult game, having to work in wretchedly constructed, rapidly deteriorating buildings, with poor equipment and an inefficient staff. The struggle to make both ends meet is a constant anxiety and adds enormously to the heavy responsibility entailed in the care and treatment of patients in considerable climatic difficulties and often great loneliness."

During the year 4 officers left the Service and 1 new recruit joined. The Lady Hardinge Medical College Hospital, New Delhi, treated 1,584 obstetrical and gynæcological cases during the year as in-patients. On the 12th September, 9 babies were born in the labour ward within 6 hours—a record for the institution. New departures are field block local anæsthesia with novocaine and adrenalin, intra-uterine injections of sterile glycerine in puerperal sepsis, and the present-day methods of treating pernicious anæmia. Admissions to the surgical unit numbered 493, and to the medical unit 909. Pathological examinations for the year totalled 5,330. An interesting finding was a pure culture of diphtheroid bacilli from the cerebro-spinal fluid of a case of meningitis in a baby; of 44 throat swabs 17 showed diphtheria bacilli, and the disease is not nearly as negligible in India as is usually supposed. The out-patient department attended to 12,027 patients.

A long series of local reports follow, from the Victoria Zenana Hospital, Delhi; the Lady Reading Hospital for Women and Children, Simla; Dera Ismail Khan; the Lady Sandeman Dufferin Hospital, Quetta; Madras; the Victoria Hospital, Vizagapatam; Bombay; Shikarpur; Karachi; the Dufferin Hospital, Calcutta, where the septic ward has been remodelled, and generous donations from the Calcutta Football Association are recorded; Agra; Lucknow; Cawnpore; Allahabad; Benares; Lahore; Rawalpindi; Nagpur; Jubbulpore; Chhindwara; Berar; Amraoti; Shegaon; Bettiah and Gaya. This mere list of places alone shows what important and widespread work the W. M. S. is doing in India. The report then closes with financial statements and observations. The general financial statement for the Countess of Dufferin's Fund shows that the total income was approximately Rs. 41,620 and total expenditure Rs. 38,718; with a closing balance of invested securities of Rs. 7,50,444. The income of the Women's Medical Service was Rs. 4,14,955 as against an expenditure of Rs. 3,89,368; with a backing of Rs. 5,93,595 in investments. Annexure VII then gives details of hospitals under the W. M. S. in 1928, with regard to staff, nurses, work done, and statistical tables for obstetric, gynæcological, and other cases attended to, and operations performed. A nominal list of members of the Women's Medical Service follows (Annexure XI).

The second report included in the volume is the 27th annual report of the Victoria Memorial Scholarships Fund. Here the work chiefly carried out is the training of *dais* at very numerous centres throughout India and their subsequent examination. And here there appears to be some difference of opinion; is it better to get hold of local *dais* and try to train them, or to import properly trained midwives into the different centres of population? Really good teachers for the former class of pupil are scarce, and health visitors who are only partly trained themselves do not make good teachers. This line of work, however, was especially opened out during the year in Bihar and Orissa, and in the Central Provinces, whilst a beginning was made in Assam. In Assam the classes for selected young women from the tea gardens with no previous experience of midwifery work proved very successful and were eminently practical, under the supervision of Dr. Winifred Thompson of St. Luke's Hospital, Chabua.

The financial statement which accompanies this report shows that the Fund is in a sound condition, with an annual expenditure of Rs. 50,880 and reserve investments of Rs. 7,88,773.

The third and final report included in the volume is that for the Lady Chelmsford all-India League for Maternity and Child-Welfare for 1928. The work carried out by this League consists chiefly of the establishment of health schools, the work at different centres where *dais* are trained, and propaganda. The health schools are for the training of health visitors, and from very small beginnings ten years ago the organisation has now spread widely all over India, and the provincial governments of the Punjab and Bengal as well as of other provinces make contributions which render such schools completely or nearly self-supporting. The Lady Reading Health School at Delhi is the most important of these schools, and 13 students passed their final examination in July. These are already working at different centres scattered throughout India. The Bengal and Madras schools continued to do useful work during the year, and a new school was opened in Lucknow. The work at the different centres is concerned with the training of *dais* and the organisation of health weeks. Infant welfare centres are maintained all over India. The work on propaganda has diminished considerably, owing to the fact that provincial public health departments have largely taken over similar duties. Baby Week was celebrated during the year in many different centres in India.

This League again shows a satisfactory financial statement; an annual expenditure of Rs. 55,985, with investments of Rs. 8,77,831.

* * * *

We have reviewed this report perhaps at some length, but that is because we are convinced that to a very large extent the future of medicine in India lies with the medical women in India. The Women's Medical Service in India may be no one's child; neither a legitimate object upon which imperial revenues may be expended—since medicine is a transferred subject; nor a matter of much interest to provincial governments who are trying their best to economise. Yet it is an organisation in being and one which is almost certain to expand to limits almost equivalent to those of the general civil medical organisation for India. It is interesting to note

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

that of recent years these three reports have now come to be combined in one annual volume, with a central office organisation for all three organisations. The reports appear to suggest some overlapping, and—to the uninitiated reviewer—it appears that a really strong and effective organisation might be built up by a combination of the three into one organisation. The one cardinal feature of the year is the memorandum presented to the Simon Commission. Will that Commission realise the tremendous present and future importance of medical attendance upon the purdah women of India by medical women, and what will it recommend?

Correspondence.

THE USE OF PNEUMOCOCCUS IMMUNOGEN COMBINED IN THE TREATMENT OF PNEUMONIA.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I was very interested to read the results of Dr. G. B. Bhaduri's treatment of lobar pneumonia with Pneumococcus Immunogen Combined (P. D. & Co.) in the leading original article of your June number.

It would be of interest to know the ages of these patients, a point which Dr. Bhaduri seems to have omitted.

The death rate from lobar pneumonia after the age of 45, as far as my experience goes, is invariably high, even with the newer forms of treatment which have been advocated from time to time, and it would be interesting in order to gauge the value of the new treatment, to have the mortality rate of the higher ages compared with the group who received ordinary treatment.—Yours, etc.,

A. R. D'ABREU, F.Z.S., L.M.S.S.A. (Lond.),
Civil Surgeon,
Mianwali.

MIANWALI (PUNJAB),
9th July, 1929.

STANDARDISED LIVES AND THEIR ASSESSMENT IN LIFE INSURANCE.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the review on p. 292 of your issue for May 1929 of my handbook on standardised lives and their assessment in life insurance, whilst thanking the reviewer, there are a few points in his review with regard to which there is some misapprehension.

He writes: "It is rather surprising that in dealing with the subject of albuminuria, the author makes no reference to kidney efficiency tests." These are undoubtedly of great value, but in what is intended to be a small handbook on the subject it is hardly possible to include such details; to do so would be to make the book more bulky than a handbook should be. Large treatises on the subject already exist, and may be referred to for details of such tests. Both my *Pocket Guide to Medical Life Assurance* and the *Substandard Lives* are intended for up-country medical examiners and may perhaps be more useful to them than large sized tomes.

With regard to "no mention being made of diastolic pressures," I may explain that blood pressure examinations are very difficult to carry out at up-country stations and remote *mofussil* towns where, oftener than not, the medical examiner, who generally happens to be a Sub-Assistant or an Assistant Surgeon or an L.M.P., does not possess the necessary instruments and very often lacks the experience for such an examination. Hence he often commits blunders in not correctly recording even systolic pressures, leave alone diastolic, which are much more difficult even for an experienced examiner to record with any exactitude. I have, therefore, not attempted to treat the subject more fully, as I should have otherwise done.

With regard to some of his other criticisms and suggestions, I certainly appreciate them and shall try to utilise them in the third edition of my *Pocket Guide*, which I hope to publish about the end of this or early next year.

The proofs, as he rightly says, have unfortunately not been carefully revised. But as the book was reprinted *in America*, from my articles contributed to the *Insurance Journal*, I had no opportunity of correcting them personally or even writing a foreword.—Yours, etc.,

JEHANGIR J. CURSETJI.

ORIENTAL GOVERNMENT,
SECURITY LIFE ASSURANCE CO.,
BOMBAY,
2nd July, 1929.

Service Notes.

APPOINTMENTS AND TRANSFERS.

LIEUTENANT-COLONEL H. W. ILLIUS, C.I.E., F.R.C.S.E., I.M.S., Civil Surgeon, Benares, is appointed to officiate as Inspector-General of Civil Hospitals, United Provinces, during the absence of Colonel Sprawson.

Major P. F. Gow, D.S.O., M.B., I.M.S., officiating Professor of Midwifery, Medical College, Calcutta, and Obstetric Physician and Surgeon to the College Hospital, was appointed to act as Second Professor of Midwifery of the institution, in addition to his own duties from the 22nd March to 18th April, 1929, both days inclusive.

The services of Major J. M. R. Hennessy, I.M.S., are placed temporarily at the disposal of the Government of the Central Provinces, with effect from the termination of his present leave.

The services of Major J. C. Bharucha, I.M.S., are placed temporarily at the disposal of the Government of Burma for employment in the Burma Jail Department, with effect from the date on which he assumes charge of his duties.

The services of Captain R. T. Advani, I.M.S., are placed temporarily at the disposal of the Government of Bombay for employment in the Bombay Jail Department, with effect from the date on which he assumes charge of his duties.

The services of Captain C. L. Pasricha, M.B., I.M.S., officiating Civil Surgeon, Burdwan, are placed temporarily at the disposal of the Governing Body of the Calcutta School of Tropical Medicine and Hygiene Endowment Fund under conditions attaching to deputation to foreign service, with effect from the 14th January, 1929, the date on which he assumed charge of his duties under the fund.

To be Lieutenants.

Dr. P. N. Gokhale, M.B., F.R.C.S.E. Dated 1st August, 1928, but with seniority from the 21st November, 1927.

Lieutenant Chandra Mani, M.B. Dated 1st August, 1928, but with seniority from the 19th August, 1927.

Lieutenant Lakshman Das, M.B. Dated 2nd August, 1928, but with seniority from the 18th August, 1927.

Lieutenant P. C. Dutta, F.R.C.S.E. Dated 7th August, 1928, but with seniority from the 25th November, 1927.

To be Lieutenants (on probation).

Patrick Joseph Walshe, M.B. Dated 29th April, 1929.
Arthur Manus Sheridan, M.B. Dated 29th April, 1929.
Joseph Hugh Boultbee, M.B. Dated 29th April, 1929.

LEAVE.

Colonel C. A. Sprawson, C.I.E., M.D., F.R.C.P., V.H.S., I.M.S., Inspector-General of Civil Hospitals, United Provinces, is granted leave on average pay for 1 month and 13 days combined with leave on half average pay for 1 month and 17 days, with effect from the 16th July, 1929, or any subsequent date from which he may avail himself of it.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Note for the Medical Profession

Puerperal Mortality.

IT is a matter of frequent comment that the rates of puerperal mortality and morbidity have not been reduced in recent years, although the incidence of sepsis in general surgery is now comparatively very small.

There exists a reasonable explanation of this anomaly.

It is probable that the majority of cases of puerperal sepsis are caused by the introduction of streptococci from without during the course of labour. This is a cause which should be preventable by the use of an efficient germicide.

The germicide in common use in obstetrics is lysol; but it can be shown that lysol has not the germicidal efficiency necessary for this purpose. The maximum dilution at which lysol will kill *streptococcus pyogenes* in fifteen minutes is 1 in 100, but owing to its causticity it cannot be used at that strength for that length of time; in other words, *the present method offers no protection whatever against streptococcal infection.* An advance in the prevention of puerperal sepsis should be achieved by the use of a germicide such as Monsol, which can be used at a strength which makes certain the destruction of the streptococci.

That Monsol has a selective action on streptococci has already been stated. From a series of tests using many different strains of streptococci, it has been found that the maximum dilution of Monsol that will kill the type of streptococci causing puerperal sepsis and septicæmia in fifteen minutes is from 1 in 1,200 to 1 in 1,500. Monsol is, therefore, over 1,000 per cent. more efficient than lysol.

Moreover, the presence of organic matter affects the germicidal action of Monsol much less than that of any other antiseptic known.

Monsol is comparatively non-irritant and can be used in stronger solution than any other antiseptic of its class.

For prophylaxis in obstetrics

use

Monsol
Liquid for dressings, douches, packs, and all sick-room purposes.

Monsol Ointment

MONSOL
BRAND
GERMICIDE AND DISINFECTANT

Monsol Capsules
Keratin-coated for intestinal disinfection

Monsol Throat Pastilles

Obtainable of all reputable Chemists in India.
Selling Agents in India: Imperial Chemical Industries (India), Ltd., Calcutta, Bombay, Madras, Karachi, Rangoon, Cawnpore, Belgaum, Lahore, Ahmedabad and Cochin.
Manufacturers: The Mond Staffordshire Refining Co., Ltd., Abbey House, Westminster, London, S. W. 1.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BISEDIA

A combination of Schacht's Bismuth and Pepsina Liquida with Sedatives.

Indicated in

Acute Dyspepsia
Gastric Ulceration
Vomiting of Pregnancy
Gastric Hyperasthenia

DOSE.—One drachm in a little water just before meals.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
Bristol, England.

BISMUTHUM CRYST.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Lieutenant-Colonel D. P. Goil, I.M.S., Civil Surgeon, on leave, is granted leave on average pay for 1 month, with effect from the 3rd July, 1929, in extension of the leave granted to him under Government Notification No. 71T.Medl., dated the 26th April, 1929.

Lieutenant-Colonel S. J. Bhathena, I.M.S., Civil Surgeon, Surat, has been granted leave on average pay for 1 month, with effect from 22nd May, 1929.

PROMOTIONS.

Major A. A. C. McNeill, I.M.S., to be Lieutenant-Colonel from 28th January, 1927 to 21st October, 1927 whilst commanding No. 33 Field Ambulance Shanghai Defence Force.

The promotion to his present rank of Major J. M. Mitchell, O.B.E., M.B., I.M.S., notified in Army Department Notification No. 1619, dated the 31st December, 1926, is antedated from the 13th December, 1926 to the 13th June, 1926.

The promotion to his present rank of Major W. C. Spackman, M.B., as notified in Army Department Notification No. 1085, dated the 7th August, 1925, is antedated from 26th July, 1925 to 26th January, 1925.

Captain (now Major) E. S. Goss, M.C., I.M.S., is granted the acting rank of Major from the 21st September, 1918 to 28th May, 1919, whilst serving with the Mesopotamia Expeditionary Force.

Captains to be Majors.

N. M. P. Dotivala, M.C., M.B., I.M.S. Dated 23rd December, 1928.

D. P. McDonald, M.B. Dated 9th January, 1929.

Amar Nath Sharma, M.B., I.M.S. Dated 12th January, 1929.

Lieutenants to be Captains.

E. G. Montgomery. Dated 22nd July, 1928.

G. F. Taylor. Dated 29th April, 1929.

W. A. Khan, M.D. Dated 10th May, 1929.

Lieutenants to be Captains (provisional).

J. Acheson. Dated 25th June, 1928.

R. A. Haythornthwaite. Dated 18th February, 1928.

RETIREMENTS.

Colonel A. Spitteler, O.B.E., M.B., I.M.S. Dated 10th June, 1929.

Lieutenant-Colonel G. Fowler, I.M.S. Dated 29th April, 1929.

Lieutenant-Colonel F. A. F. Barnardo, C.I.E., C.B.E., M.D., F.R.C.S.E., I.M.S., from the 4th June, 1929.

Lieutenant-Colonel L. E. Gilbert, C.I.E., M.D., I.M.S., with effect from the 20th January, 1929.

Lieutenant-Colonel J. K. S. Fleming, C.B.E., I.M.S. Dated 5th July, 1929.

NOTES.

WATSON'S *INSTRUCTIONS TO PATIENTS.*

MESSRS. H. K. LEWIS, the well known firm of medical publishers, 136, Gower Street, London, W.C. 1, have drawn our attention to these leaflets, of which they are the publishers. Medical treatment is not simply a question of the "bottle"—despite an almost unanimous belief to the contrary in this country; advice with regard to diet, habits, exercise, etc., is as important or more important than the prescription.

The leaflets are 6 × 4¼ inches in size, and cover a very wide range of subjects. They are simple and give the patient exactly what he wants, clear and simple instructions. Sixteen of the series have been published; and include such subjects as how to give hot fomentations; gonorrhœa; the alkaline treatment of gastric and duodenal ulcer; exercises for constipation; how to cleanse the eye; nasal douching; diet in obesity; after-care in dental extractions; poultices; syphilis; the treatment of constipation; breathing exercises; scabies; advice to pregnant women; pulmonary tuberculosis; and the management of febrile cases.

These leaflets have been designed by T. T. B. Watson, M.B., B.Ch. (Camb.). They are issued in sets of 25 in a folding cover at 1*s.* per set of 25. A holder is also supplied at 9*d.* which will take a supply of several of the "Instructions" which may be selected to suit the needs of individual practitioner of specialists.

The use of such a system as this should save the general practitioner many hours of talk and worry.

HYGIENIC LININGS FOR GOGGLES.

THE British Hanovia Quartz Lamp Co., Ltd., Slough, Bucks, England, have recently placed on the market an ingenious lining of porous paper for use with goggles. In the *x*-ray and electrotherapy room these linings overcome the risk of spreading disease from one patient to another by using the same pair of goggles. The linings are placed on the inside of the goggles and are held in place by slits, cut in the sides, through which the elastic band is passed. It is claimed that with these linings goggles remain clean and hygienic for a longer period, and the leather will no longer adhere to the heated skin. They are produced in two sizes; No. 1 for adults at 15*s.* per 1,000; and No. 2 for children at 13*s.* 6*d.* per 1,000. An enamelled stand to hold 500 such linings threaded on nickelled pins is also sold at 3*s.*

The same firm have also recently introduced hygienic guard rings of paper for attachment to the cork ring of the Sollux lamps and the Kieffer localisation tube. The new guard rings prevent contamination of the cork, and therefore safeguard the patient from risk of contagious diseases. These are sold at 15*s.* for 100 for attachment to the Sollux lamp, and 10*s.* 6*d.* per 100 for attachment to the Kieffer localisation tube.

THE QUARTZ LAMP.

THIS is a small brochure of some eight pages published monthly by the Alpine Press, Inc., U. S. A., of which we have received the issues for March, April, and May 1929. It consists chiefly of abstracts of papers published in other journals or read at medical conferences, together with a bibliography each month of the papers published in heliotherapy and actinotherapy. The range of subjects covered is considerable, and these three numbers include papers on the quartz lamp in rickets and spasmophilia; the treatment of psoriasis; the effective dose in treating erysipelas with the quartz lamp; the treatment of tuberculosis of the cervix uteri; heliotherapy in pulmonary tuberculosis; an editorial from the *British Journal of Actinotherapy* on the Medical Research Council's report on ultra-violet radiation; and the hatching of eggs under ultra-violet light. The journal is one which may be of interest to radiologists and general practitioners.

BRAND'S ESSENCE OF CHICKEN.

MESSRS. BRAND AND CO., London, whose advertisement of their essence of chicken appears elsewhere in this issue, have been invalid food specialists for nearly ninety years, and during the whole of that time have held the appointment to supply their products to the royal household. Brand's Essence of Chicken is a well known and reliable product, and is of special value where hardly any other diet can be tolerated in cases of gastric disorder, fevers, impaired digestion, and neurasthenia of whatever cause. The tins for India are overprinted in red ink "specially manufactured for the Indian market."

The India representative of the firm, Mr. A. H. P. Jennings, Block F 4, Clive Buildings, Calcutta, will be pleased to supply literature and price lists at any time on application to him.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

NEW MATERIALS FOR MOULDS AND CASTS.

"NEGOCOLL," "HOMINIT" AND "CELERIT."

A NEW process for taking moulds and casts of the human body or any inorganic object has been invented and developed by Prof. Dr. A. Poller of Vienna and is causing considerable interest on the continent amongst medical authorities, criminal police branches, etc. This system is based on different principles from those which have been in use up to the present and it presents new possibilities in research work with regard to the plastic reproduction of any interesting phenomenon.

The fundamental principle of the process lies in the new moulding material, called "Negocoll," which differs entirely in its composition, as well as in its application from the materials which have hitherto been employed. "Negocoll" is a hydrocolloidal moulding material, clean and simple to use and practically indestructible. A further advantage consists in the fact that objects to be copied do not need to be prepared in any way, even if they are covered with hair. The smallest details are faithfully and accurately reproduced.

"Negocoll" melts at 210°F., forming a thick pulp. After the "Negocoll" has cooled down sufficiently and whilst it is still in a liquid state (much below 210°F.), it is applied over the object to be copied by means of a brush, spatula or the fingers. As the "Negocoll" is free from germs, it can be used straight away over wounds or for mouldings of interior organs. Owing to the exceptional elasticity of "Negocoll" even in the cold state, it is possible to mould objects with deep undercuts, without the necessity of reproducing the object by means of separate piece moulds.

In order to obtain from the "Negocoll" negative the corresponding positive object, it is essential to use the special positive masses "Hominit" and "Celerit." These compositions are extremely hard and melt at about 240°F. As the molten "Hominit" becomes practically as liquid as water, it penetrates into all the pores of the "Negocoll" negative and thus reproduces the most minute details of the negative form. The positive masses can be reinforced by means of gauze or fibre material, whereby the resulting form becomes not only exceedingly hard, but is also practically unbreakable. A further advantage of the "Hominit" and "Celerit" objects, compared with the usual wax and paraffin mixtures, is that they can support high temperatures and therefore easily resist the hottest climates. This is of particular importance for research work in hot countries, as it gives a means of reproducing accurately and permanently certain phenomena occurring in many tropical diseases.

Owing to the practically unlimited field in which "Negocoll," "Hominit" and "Celerit" can be used with the greatest advantages, they have already been adopted for standard use not only by many leading medical institutes, hospitals, laboratories, etc., on the continent, but they have also largely been introduced in universities, schools, criminal police investigation departments, etc.

The British agents for these products are Apotela, Ltd. (England), 65, Moorgate, London, E. C. 2.

HICKS' CLINICAL THERMOMETERS.

WE have been asked to draw the attention of our readers again to Hicks' clinical thermometers, an advertisement of which appears on p. xlvii of this issue. We need hardly emphasise the necessity for the medical man in India to use clinical thermometers which are absolutely reliable, for the Indian market is flooded with cheap and spurious thermometers, which may be as much as 2° to 3° F. out. They may be cheap, but even so they are bad value.

Hicks' thermometers have a reputation of very many years of sound workmanship behind them. Every thermometer issued is fully tested by an expert before it leaves the factory and is reliable. The firm, in brief, can well claim to be the premier thermometer makers of the world.

The representative for India is Mr. A. H. P. Jennings, Messrs. Allen & Hanburys, Ltd., Block F 4, Clive Buildings, Calcutta, who will be glad to forward price lists on application.

NUMOTIZINE.

WE are requested by the manufacturers of "Pneumophthysine," a medicated emplastrum, to bring to the notice of our readers that they have changed the name of this preparation to "Numotizine, Inc.," in order to bring the name of the product into line with modern ideas regarding nomenclature of pharmaceutical preparations. The new name is simply a simplified spelling of the old, and there has been no change in the product or its packing.

It is claimed that this emplastrum contains 2.6 parts of guaiacol, 2.6 of formalin, 13.02 of creasote, 2.6 of quinine, 2.6 of methyl salicylate, to 1,000 parts of glycerine and aluminium silicate. It is therefore obviously eminently suitable for application as an emplastrum in all cases of pneumonia, rheumatism, or other inflammatory conditions.

The agents for India are The Indian Alkaloidal Co., Princess Street, P. O. Box No. 2062, Bombay, No. 2, who will be glad to send specimen containers on application.

AN INEXPENSIVE STOP-WATCH.

IN order to count the pulse beats accurately, a watch with a centre-seconds hand is almost an essential to the medical practitioner. And in this connection the Arnold stop-watch, which has been commented on favourably by *The Motor* for January 15th, 1929, and *The Electrical Times* of January 31st, 1928, is of interest. Whilst this watch is primarily designed for engineers, umpires at races, etc., it is also of medical interest. The watch is of the usual 30-hour type with lever movement, and carries a centre-seconds hand reading to one-fifth of a second. This centre-seconds hand can be stopped at any instant by pressing a knob at the side. The watch is guaranteed for twelve months. It is manufactured by Messrs. A. Arnold & Co., 17, Elmcroft Avenue, Golders Green, London, N. W. 11; and is sold at 7*s.* 6*d.*, plus postage. The same firm also manufacture a special minute and seconds watch for races, and a chronograph guaranteed for five years.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers, relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India, Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

NOTES ON THE NEW CONCEPTIONS OF SCIATIC PAIN AND ON ITS TREATMENT.

By J. B. HANCE, O.B.E., M.A., M.D. (Cantab.), F.R.C.S.E., MAJOR, I.M.S.,
Rajkot,
N. C. MODY, M.B., B.S.,
Radiologist, West Hospital, Rajkot,
and
SHIVA DATTA UJWAL, L.M.P. (C. P.),
Officer-in-Charge, Radiology and Electro-Therapeutics, Hewson Hospital, Jodhpur.

THE pathology of sciatica, which has hitherto remained obscure, has recently been illuminated by the observations of Professor Putti and others, a summary of which was placed before the profession by the eminent Italian orthopædist in his Lady Jones lecture of 1927.

As a result, not only has the pathogenesis of the condition been placed upon a more orderly basis, but an avenue has been opened up for its rapid and successful attack, as opposed to the symptomatic treatment hitherto employed, which can be described neither as rapid, nor as particularly successful.

Putti arranges his pathological classification of sciatic pain under three heads:—

(*i*) *Primary sciatica,*
(*ii*) *Secondary sciatica,* and
(*iii*) *Idiopathic or rheumatic sciatica.*

Primary sciatica is expressive of a true peripheral neuritis, caused by generalized toxæmias such as alcoholism, lead-poisoning, diabetes or syphilis; while *secondary sciatica* is caused by irritation of the nerve in its course from local causes; neoplasms, vertebral or pelvic, malunited fractures, or syphilitic or tuberculous granulomata.

These form the minority of the cases seen; by far the greater number are of neither of these types, but belong to the third category, idiopathic or *rheumatic* sciatica, whose pathology has hitherto been indeterminate.

Putti claims that these cases are an expression of variations from the normal in the intervertebral foramina of the lumbar column, from causes anatomical or inflammatory, and usually from both in combination, the effect of which is to expose the nerve fibres to compression and irritation.

The objects of this paper, which is based on observations on a series of 15 cases of sciatica and lumbago treated by the senior author in collaboration with one and other of the junior writers, are to add, for what it is worth, their testimony to that of Putti regarding the pathogenesis of so-called "idiopathic sciatica" and to bring forward suggestions as to its treatment.

Sciatica and its precursor, lumbago, is one of the commonest complaints of hospital practice in India, and, in the experience of the writers, such are cases in which treatment on hitherto accepted lines, analgesics, massage, counter-irritants, injections of so-called "specifics," nerve stretching, etc., yields results which are very far from satisfactory.

If, as the writers believe, Putti's conceptions of the pathogenesis of the condition are correct, this failure of treatment is not surprising, since it is based on faulty pathology, and leaves the cause untouched, if it does not, as in the case of nerve stretching, do actual harm.

Considerations of space forbid any but the briefest summary of Professor Putti's brilliant exposition; but a short review of points relevant to the writers' clinical findings is unavoidable.

They comprise consideration of:—

(*i*) The anatomy of the spinal nerve in the intervertebral foramen.
(*ii*) The anatomy of the intervertebral foramen.
(*iii*) The normal character of the posterior intervertebral articulations of the lumbar region, with the more common variations from the normal, Putti's "anomalies of tropism," and
(*iv*) The effect upon the intervertebral foramen and the nerve it contains of inflammatory changes in the posterior intervertebral joints.

(*i*) The spinal nerve, carried by the foramen, is the complete spinal nerve, i.e., that part formed by the junctions of the anterior and posterior roots, and which on emerging divides into anterior and posterior divisions.

This part of the nerve has been designated the funiculus; it is extra-arachnoid but intradural, and carries with it a funnel-shaped prolongation of the dura mater, which eventually blends with the sheath of the nerve trunks. In contrast to the intraspinal portions it has no protective bath of fluid, but is surrounded by a rich venous plexus, which is much influenced by mechanical and inflammatory conditions outside the funiculus.

(*ii*) The intervertebral foramen is bounded *above* by the intervertebral notch; *in front* by a small portion of the body of the vertebra above, the intervertebral disc and a small portion of the body of the vertebra below; *below* by the neural process of the vertebra below and *behind* by the posterior intervertebral articulation, any change in which must therefore intimately affect the foramen and its contents (Fig. 1). Further, the foramina in the lumbar region vary in size, the 5th being the smallest of all, but carrying the 5th lumbar nerve, the largest in size and the main constituent of the sciatic nerve (Fig. 1).

(*iii*) Normally the plane of the articular surfaces in the posterior intervertebral articulations in the lumbar region is the sagittal plane, with

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

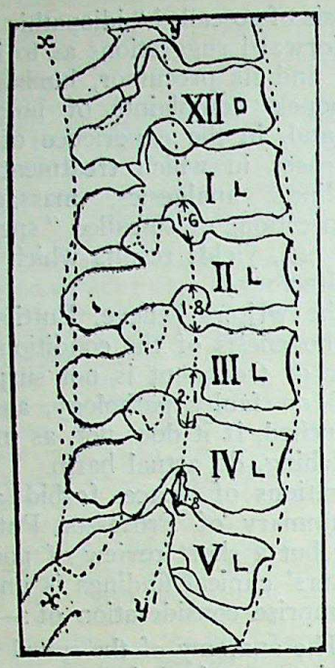


Fig. 1.—(After Putti).

the exception of those between the 5th lumbar vertebra and the sacrum, which are usually disposed in the coronal plane (Fig. 2).

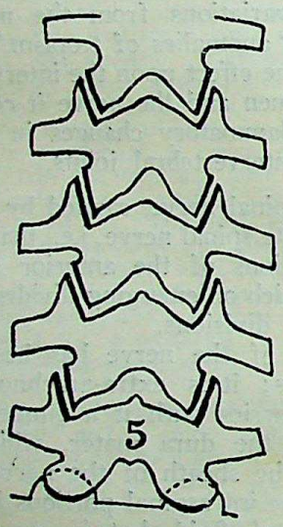


Fig. 2.—(After Putti).

But variations in this "tropism" are common, especially in the lower lumbar vertebræ, where one of a pair may be found normally disposed, while its fellow may be tending towards, or actually in, the coronal plane (Fig. 3).

These changes are especially marked and frequent in the lumbo-sacral articulations (Fig. 4).

It will be seen that any such anomalies of "tropism" will tend to constrict the intervertebral foramen and, possibly, to compress its contents, and where these changes are associated, as is not infrequently the case, with sacralization of the 5th lumbar transverse process, constriction of the foramen will be still more marked.

Both the normal articulations and variations from the normal are demonstrable by the *x*-rays; but skiagrams of a very high technical quality are necessary for the purpose; and Figs. 2 and 4 are diagrammatic representations of the *x*-ray appearances.

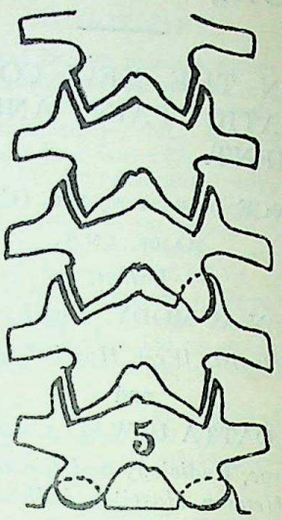


Fig. 3.—(After Putti).

Radiogram 1 also illustrates the normal, the line of articulation on the left side being clearly visible,

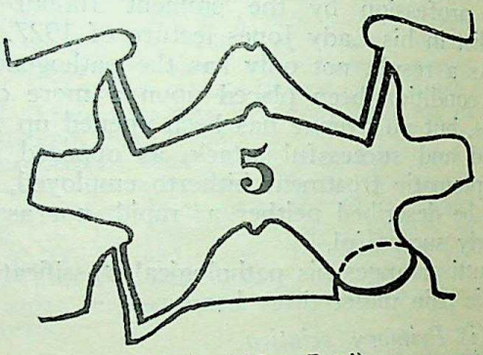


Fig. 4.—(After Putti).

that on the right being partially obscured by the arrow point.

(*iv*) The changes consequent on infective arthritis of the intervertebral joints are those of infective arthritis elsewhere: swelling, effusion, erosion and ankylosis; and their *x*-ray appearances are those of arthritis, "fluffing" of the outline of the articular cartilage and blurring of bony margins. Ankylosis is indicated as elsewhere by absence of articular outline. These changes are demonstrable in the intervertebral joints by radiograms of a high technical quality and the appearances are diagrammatically represented in Fig. 5, the left side showing arthritis and the right ankylosis. Such changes will also obviously tend to constrict the lumen of the intervertebral canal and to compress and irritate its contents. Further, constriction from whatever cause will tend to obstruct the venous outflow from the plexus, and still further to compress the nerve funiculus in consequence, while the inflammatory factor will add its quota to the concomitant venous congestion.

On these observations, and on the results of treatment directed to them, Putti bases his thesis that the so-called idiopathic sciatica is a symptom

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of a neuritis of a specific nature; a neuralgia caused by pathological conditions of the intervertebral foramina and articulations. It is a symptom of irritation of the nerve in the bony canal through which it passes—"neurodocitis"—

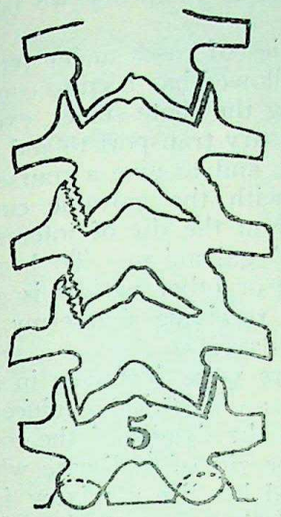


Fig. 5.—(After Putti).

and of lumbar arthritis; and Putti advocates the substitution of "arthritic" or "vertebral" for "idiopathic" in the designation of the disease.

Clinical Features.

Putti has shown that there is no pathognomonic sign or symptom in cases of sciatica, and few which are even constant; but there are certain features which, taken together, suggest the diagnosis; and skiagrams, if sufficiently good, establish it. The suggestive features are:—

(1) Preliminary lumbago.

(2) Rigidity of the lumbar spine with spasm of the erectores spinæ.

(3) Scoliosis.

(1) *Preliminary lumbago.*—This symptom receives no attention from Putti, but was a constant feature in all but one of the cases here recorded; in this one case of sciatica followed a violent spring to one side when jumping a ditch.

In all the others, each attack was heralded by preliminary pain in the back, aggravated by any but the slightest movement. This phase varied in duration from a few hours to one to three days, after which the pain adopted the typical sciatic character.

(2) *Rigidity of the lumbar spine.*—This was a constant feature in our series, and Putti states it to be invariable in idiopathic sciatica, thereby differentiating the latter from sciatica due to inflammation of the nerve roots, and from all forms of secondary sciatica. On examining the patient in the sitting position the erectores spinæ are found to be in spasm, hard and board-like. The patient, if asked to lean forward does so from his hips, while the lumbar and lower dorsal vertebræ remain fixed as in spinal caries; and any attempt on the part of the examiner to overcome this rigidity meets with instant and heartfelt protest from the patient on account of the aggravation of his pain. This symptom is earlier in appearance than scoliosis and persists throughout the course of the disease, marked during attacks, less accentuated between them.

(3) *Scoliosis.*—This was a frequent, though not invariable physical sign in the present series of cases. It may be said that it was a feature of the more acute cases and was not so marked in those less severe. Examples occur of both homolateral and contralateral scoliosis, the latter, as stated by Putti, being the commoner.

No case of alternating scoliosis occurred in our series, although cases showing intervertebral arthritis of both sides—the condition which Putti considers the causative factor in alternating scoliosis—did occur.

Accepting, as we do, Putti's views on the pathogenesis of idiopathic sciatica, we consider that these three symptoms are the logical outcome of intervertebral arthritis.

The scoliosis is the fixture of the joints in a position of ease; the homolateral deformity results in the separation of the inflamed joint surfaces and the opening up of the intervertebral foramina, the contralateral is the fixation of the joints in the relaxed position and also relaxes the nerve cords as they pass through the foramina. The muscular spasm is identical with the protective spasm over any inflamed joint, and, as in the case of other joints, is the cause of the faulty position and, as in other cases, is diminished or abolished, with resultant diminution or abolition of the deformity by successful treatment. *Vide* Case I.

The lumbago is exactly analogous to the localized pain in arthritis of other joints. Indeed, if one considers the hip joint, affected with chronic progressive osteo-arthritis with periodical exacerbations, we observe the same phenomena except that we call them local pain, protective spasm, and fixation in the position of abduction or adduction; and the sciatica is exactly comparable to the pain often seen along the distribution of the anterior crural nerve, caused by pressure on its divisions as they pass over the deformed and distorted femoral head.

Diagnosis.

The diagnosis of idiopathic sciatica depends upon the exclusion of the other varieties, primary and secondary sciatica, and upon positive *x*-ray evidence. Careful history-taking and a meticulous clinical examination are essential; and special attention should be paid to such points as the Wassermann test, the passing of a finger into the rectum, and the presence or absence of rigidity of the erectores spinæ and scoliosis.

The writers would venture to emphasize the importance of the two former measures, which should be a routine, but which in practice they do not find to be so. Syphilis may cause sciatica of the idiopathic type by lumbar intervertebral arthritis, and an appreciation of the fact will bear materially on its treatment; while the practitioner who neglects to examine the rectum will one day

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

incur the chagrin and loss of prestige of failing to recognize the presence of a rectal carcinoma or other pelvic neoplasm.

Having excluded other causes by consideration of the history and appropriate examination, the diagnosis of idiopathic sciatica is established by the *x*-rays. It is important to take both antero-posterior and lateral radiograms, as well for appreciation of the extent of the disease, as for gauging the results of treatment. The technical details of milliampèrage, kilovoltage and exposure time must necessarily vary with the build of the patient and the calibration of the individual *x*-ray unit used. The results at present illustrated were obtained with a transformer of the "Snook" type, a 30-milliampère fine focus Coolidge tube and the factors of current, kilovoltage, exposure and distance for patients of average build as tabulated below:—

Position.	*Distance.*	*K-V.*	*M. A.*	*Time.*
Anteroposterior	25 inches	88	10	6 sec.*
Lateral ..	25 inches	88	10	30 sec.*

With Potter Bucky Diaphragm.

* Time is for patient of average build, and is the only variable factor.

Treatment.

Putti summarizes the treatment of idiopathic sciatica in the phrase: "active hyperæmia and immobilization." He outlines his system of applying it, which consists of daily hot air baths extending over a period of 18 to 20 days, combined with an immobilizing (*not* corrective) plaster jacket which is followed by a celluloid jacket which "may be required to be worn for over a year."

Such a course of treatment, radical and admirable though it be, is out of the question for the Indian hospital patient, who would never submit to it even were a celluloid jacket within his reach, and is a severe handicap to the European patient, even of the leisured classes, of whom there are few in India. To most of them a degree of activity, greater rather than less, is an essential to the gaining of their livelihood, and few can afford to be laid up or partially inactivated for considerable periods.

The writers, therefore, had to cast about for some less exacting form of treatment, and one less restricting to the activities of the patient; and they wish to place on record their very deep sense of obligation to Mr. R. W. Armstrong of the Victor *x*-ray Corporation, who, in the course of a discussion on means of applying active hyperæmia, suggested diathermy.

Theoretically, the treatment is ideal, since, while the high-frequency current will generate heat impartially throughout the area of interest, this will be rapidly dissipated from the soft parts through the ordinary mechanism of heat dispersion, but from the denser, less vascular bony and ligamentous structures, its dissipation will be very much less rapid. In other words, diathermy theoretically provides the means of applying a hot fomentation to the inflamed joints, and one whose effects are much more lasting than those of the more usual variety. That it carries out in practice what it promises in theory we hope to show in this paper.

In the series of cases under report the line of treatment followed has been to confine the patient to bed during the acute stages, except, of course, for the necessary transport to and from the radiological block, and to give a course of diathermy, alternating with the galvanic current with the negative pole at the site of interest, the so-called "dispersive" galvanism. To begin with, treatment of one or other variety is given daily, the patient thus receiving diathermy and galvanism on alternate days.

The writers were fortunate in having as their first patient an electrical engineer, who was as interested in the details of the course as he was anxious to be rid of a disease which had in the past rendered his life a misery for considerable periods; and they owe much to his constructive criticism, as well to his familiarity with electricity which gave them very useful information as to tolerance and dosage.

They find with diathermy, as Putti found with hot air baths, that the first effect is an aggravation of the pain, which, however, rapidly passes off giving place to marked relief. The aggravation of the pain lasts for an hour or two after the first application, for a much shorter period after the second, and is usually entirely absent after the third. Regarding the effects of galvanism, the writers cannot dogmatize, but the patient referred to definitely stated that the relief experienced from diathermy is greater when it is allied with galvanism than when it is applied alone. This may possibly be ascribed to the effect of chlorine ionization from the normal saline in which the electrodes were moistened or simply to the hyperæmia produced in the area of interest by the passage of the galvanic current.

After a period of daily treatment which varies from a week to ten days, the patient may be allowed up with crutches or sticks, and usually requires these aids for a further week, after which they are no longer necessary, while after the third week all pain and discomfort have usually disappeared.

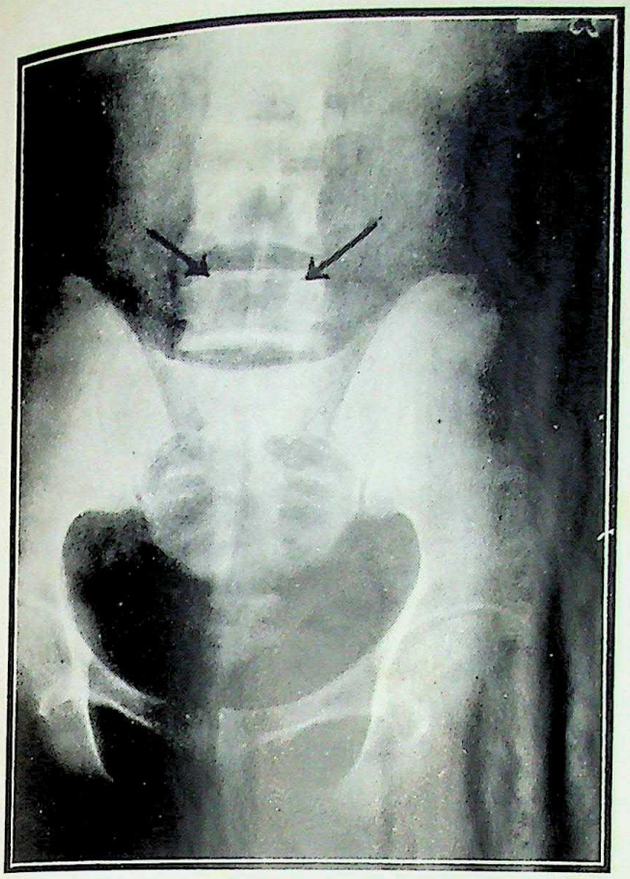
By this time daily attendances may be dispensed with and the patient need only attend on alternate days, still receiving each variety of treatment alternately. The interval may be gradually lengthened to attendances twice a week and so to weekly visits until they cease altogether.

The effects of treatment should be gauged by periodical skiagrams which are most instructive, and which will be discussed in detail when considering individual cases; but it may here briefly be stated that in each case they show a progressive clearing up of the condition; joint outlines reappear, lateral views show clearing of the intervertebral foramina; scoliosis progressively lessens

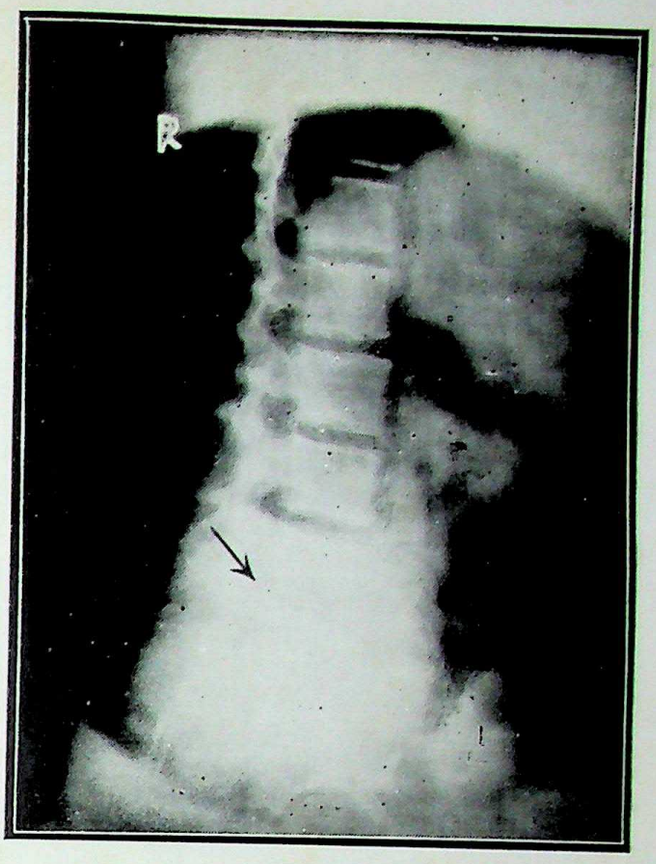
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

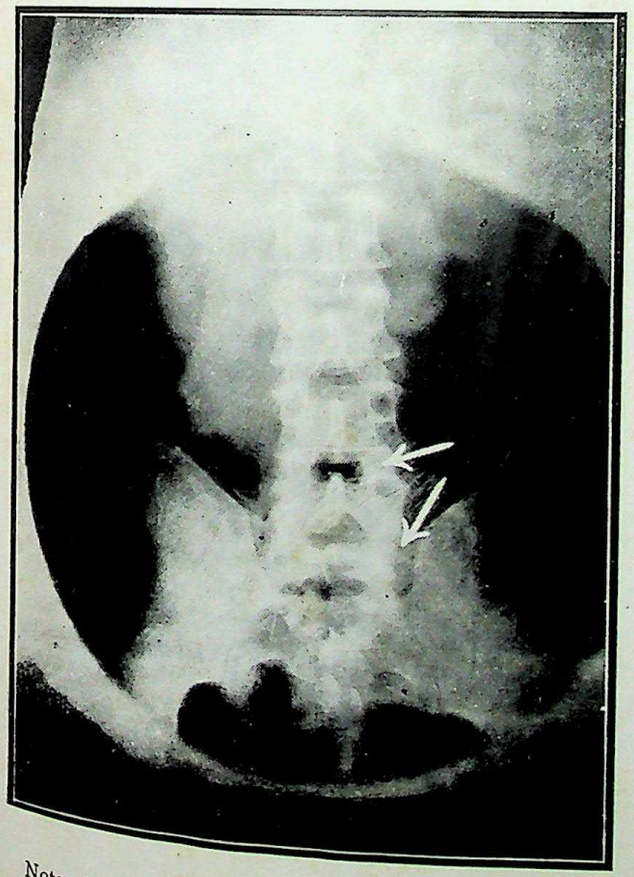
PLATE I.



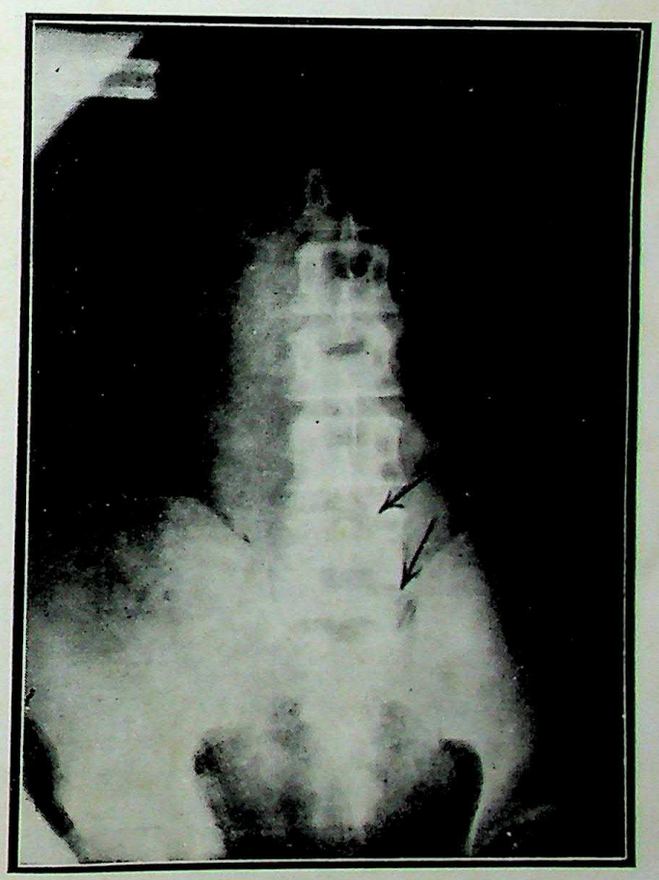
RADIOGRAM 1.
Normal. Note articular line on the left, partially obscured by arrow head on right.



RADIOGRAM 3.
Partial filling of 4th foramen, 5th invisible.



RADIOGRAM 2.
Note obliteration of articular line and contralateral scoliosis.

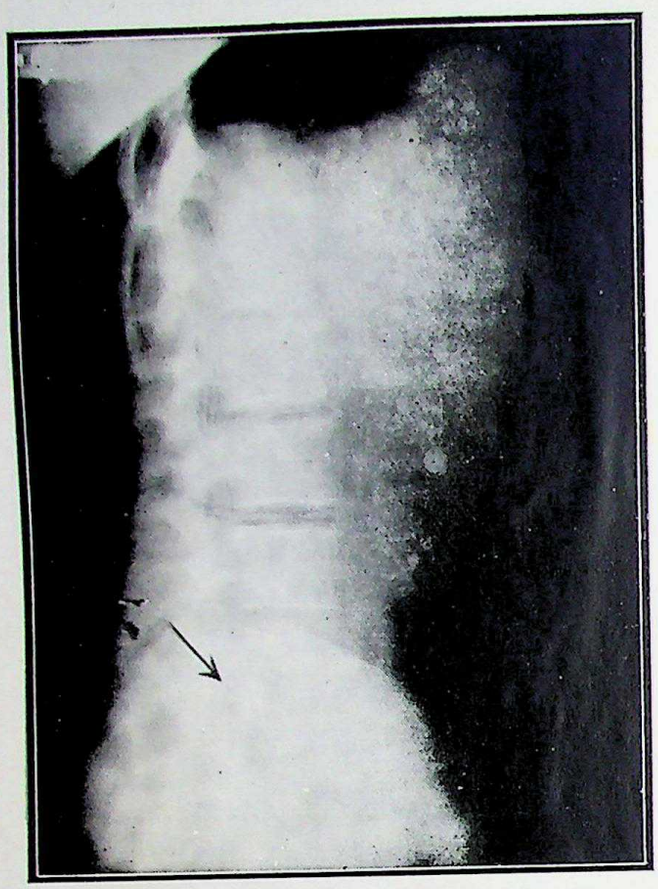


RADIOGRAM 4.
Articular line reappearing. Especially lumbosacral.

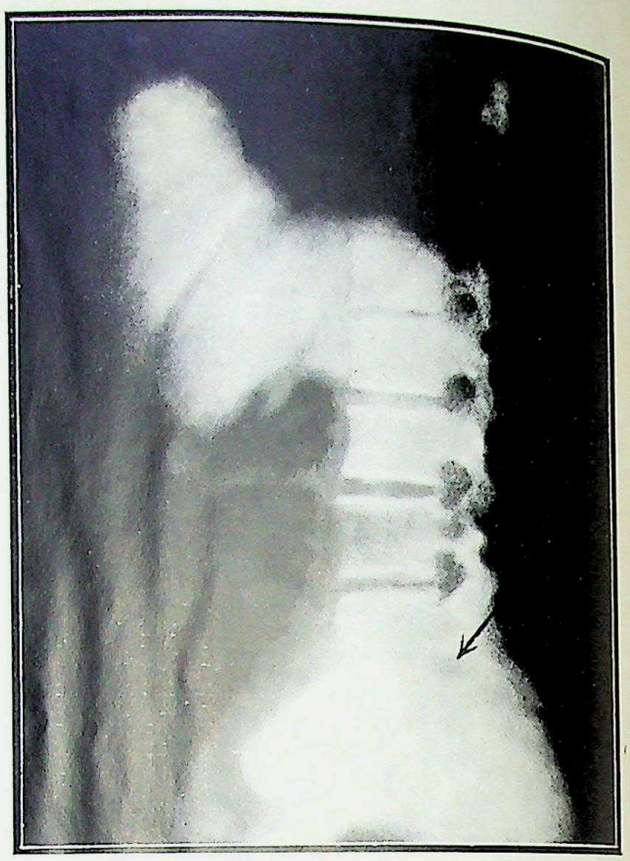
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

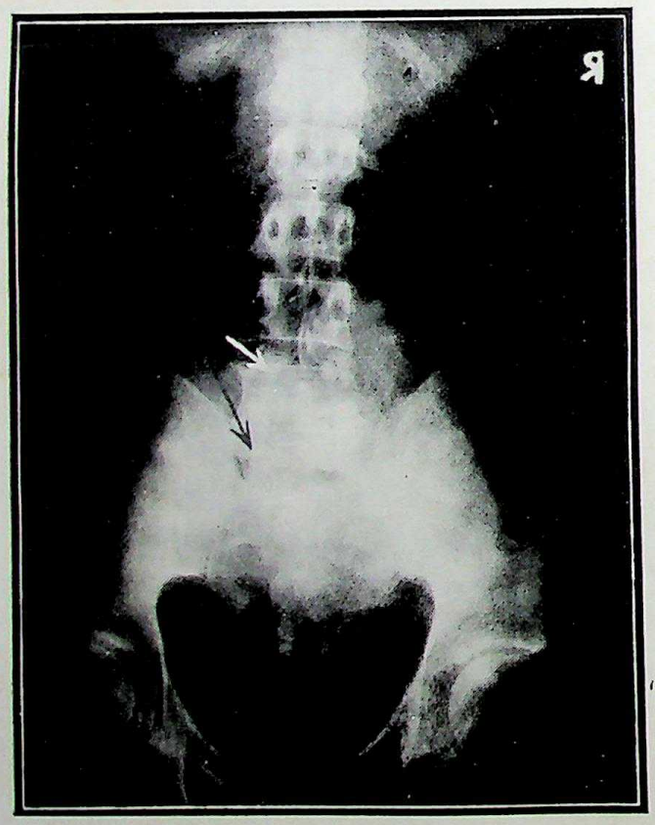
PLATE II.



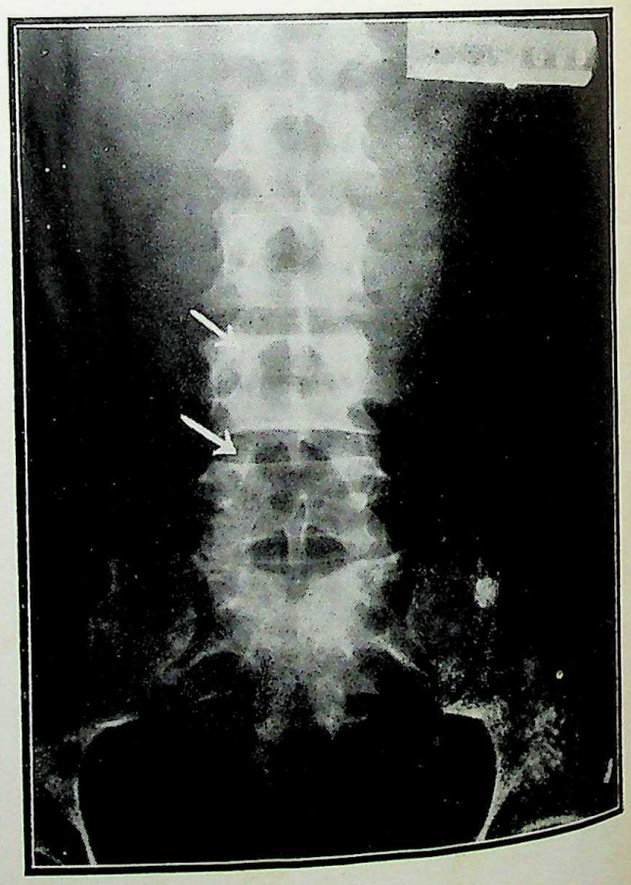
RADIOGRAM 5.
5th lumbar foramen visible, deposit in lower part of 4th clearing.



RADIOGRAM 7.
4th foramen clear.
5th distinctly visible.



RADIOGRAM 6.
Joint outline visible.



RADIOGRAM 8.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and disappears, while clinical examination reveals a diminution in lumbar spasm which finally ceases.

So much for treatment directed to the site of the disease. But there is another consideration which in our experience is of the greatest importance, eradication, where possible, of the cause.

The very name infective arthritis postulates an infective focus, and the most painstaking efforts to trace and eradicate such foci should be made. In our experience the majority are dental or intestinal, but all possible localities, tonsils, nasal sinuses, middle ear, urine, and, where possible, duodenum, should be investigated.

Two of our European patients revealed dental foci which gave pure cultures of non-hæmolytic streptococci, while a third, after a lengthy investigation, gave positive cultures of *B. flexner* from his stools.

Autogenous vaccines were prepared and administered in each case with beneficial results.

Indian patients of the hospital class, however, while they usually carry in their mouths obvious possible foci, have a strong objection to dental extraction for the purpose of culture, and treatment has often to be confined to diathermy and galvanism. But in two cases extraction of teeth, shown to be faulty by the *x*-rays, revealed short-chained non-hæmolytic streptococci, while in a third similar organisms were recovered from the urine, and in the case of a female patient catheter specimens of urine gave a pure growth of *B. coli.*

The resultant vaccines were administered in each case.

Details of Cases.

Considerations of space preclude a detailed discussion of each case in the present series; a summary of them is given in the attached table and the writers have confined themselves to a brief description of a few cases which may be accepted as typical of the clinical features and results of treatment.

Those of our readers who are experienced in radiology are aware that the lumbar spine is one of the most difficult subjects in the whole body as regards the production of radiographic detail. They will need no reminder from us that in such cases details which are perfectly clear in a 14 ins. by 17 ins. film when viewed in a viewing box may not be by any means so obvious in a 3 ins. by 4 ins. reproduction on a printer's block. The writers feel that much credit is due to the makers of the blocks of the radiograms published with this article for having reproduced with such clarity fine points of radiographic detail concurrently with so marked a reduction in size.

Case I. (*Radiograms 2—7.*) *Mr. C. H. W., European, æt. 48 years, Electrical Engineer. Left-sided sciatica. November* 1927.

Trouble dated from active service in Mesopotamia, since when patient had had four or five attacks becoming progressively worse. Last two had crippled him and necessitated the use of crutches for weeks on end. When seen was crippled and on crutches, unable to get relief either sitting or lying except when pain was controlled by aspirin and caffein. The pain extended from left gluteal region to left heel.

Examination.—Wassermann reaction negative; rectum normal; urine normal; wears denture with two remaining teeth, *x*-rays of which were pronounced healthy by dental surgeon. Marked lumbar spasm and exquisite tenderness of sciatic nerve at gluteal fold. Muscles of thigh and calf wasted by 1¾ and ¾ inches respectively as compared to other side.

X-rayed, 5th November, 1927 (Radiograms 2 and 3). Contralateral scoliosis, joints between 4th and 5th lumbar vertebræ and between 5th and sacrum obscured. Filling of 5th lumbar intervertebral foramina with inflammatory exudate. Diathermy daily for 5 days, followed by diathermy and galvanism on alternate days. Marked immediate relief; aspirin abandoned after 3 days and slept normally. After 15 days walked easily with stick. After 3 weeks discarded stick. After one month climbed a hill to examine cable.

5th February, 1928. Slight recurrence of pain.

X-rayed again (Radiograms 4 and 5). Contralateral scoliosis present but less marked, joints and foramina much clearer, but still remains of exudate in 5th foramen. *B. flexner* isolated from stools and vaccine prepared. Diathermy and galvanism resumed on alternate days with immediate relief. Twice weekly after a fortnight for one month, thereafter weekly for one month.

11th May, 1928. *X*-rayed again (Radiograms 6 and 7). No scoliosis, joints and foramina clear. No lumbar spasm. Has performed all duties with entire freedom from symptoms and has indulged in a weekly small game shoot throughout the cold weather 1928-29.

Had slight twinge May 1929, which disappeared with purgative.

(*Note.*—Since going to press information has been received from the author that this patient has had a severe return of symptoms confining him to bed. *B. coli* have been isolated from the urine, and it is hoped that a combination of autogenous vaccine with diathermy and galvanism will once more give complete relief.—Editor, *I. M. G.*)

Case II. Mr. H. S. H., European, male, æt. 42, *Civil Engineer. November* 1927.

Slight sciatica cold weather 1926-27 which disappeared with massage and rest. Return in aggravated form November 1927. Primary and secondary sciatica excluded. Marked lumbar spasm. *X*-rays showed contralateral scoliosis, fluffing of joints and foramina (Radiogram 8). Dental *x*-ray; apical infection of upper molar.

Diathermy and galvanism alternate days for 14 days. Complete relief and proceeded to dental surgeon. Molar tooth extracted and cultured. Non-hæmolytic streptococcus grown and vaccine prepared. Diathermy and galvanism bi-weekly for 1 month after return from dentist, then discontinued. Has remained free of trouble.

Case III. Mr. J. P., European, male, æt. 40, *Civil Engineer.*

Acute right-sided sciatica following a side-ways jump. January 1928.

No evidence of primary or secondary sciatica.

X-rayed, 26th January, 1928 (Radiograms 9 and 10). Homolateral scoliosis, fluffing of joint outlines and filling of 4th and 5th foramina. Diathermy and galvanism alternate days for 1 week with rest in bed for 4 days. Left for dental surgeon who extracted and cultured suspicious bicuspid. Non-hæmolytic streptococcus isolated and vaccine prepared. Returned to own station and continued diathermy and galvanism for 6 weeks at increasing intervals. Has remained free of trouble since.

Case XI. M. S., Mahommedan, male, æt. 65, *Faqir, April* 1928.

Had fallen from a horse a year previously and had pain resembling renal colic at intervals for some 12 years back. After his fall was able to walk, but soon developed slight pain in back, which later settled into left-sided

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

sciatica and became progressively worse. Teeth foul, extraction declined. Primary and secondary causes excluded.

X-rayed, 13th February, 1928 (Radiograms 11 and 12). Stone in *right* kidney. Fluffing of left intervertebral joints between 3rd, 4th and 5th lumbar vertebræ and between 5th and sacrum. Narrowing of 4th and 5th foramina. Diathermy and galvanism on alternate days for 3 weeks. Complete relief and insisted on leaving hospital.

X-rayed, 11th March, 1928 (Radiogram 13). Joints much clearer.

Treatment of stone in kidney declined. Discharged relieved, and not since heard of.

Case XIII. Mrs. P., Hindu, female, æt. 35, *April* 1928.

Acute sciatica at intervals of years, both sides, worse at periods. Hysterectomy some years previously but pain persisted. Poor general health. Primary and secondary sciatica excluded. Teeth foul, extraction refused. Urine cultured, pure growth of *B. coli;* vaccine prepared.

X-rayed, 23rd April, 1928. Slight left-sided scoliosis. Fluffing of intervertebral joints both sides, 4th and 5th lumbar foramina narrowed.

Diathermy and galvanism alternate days for 3 weeks with relief, then bi-weekly. After 1 week took discharge against advice, alleging herself cured.

Case XV. Z. S., Hindu, male, æt. 20, *zemindar, weight* 20 *stone. November* 1928.

Acute sciatica, right side, developed spontaneously. Crippled, and can only hobble with stick, unable to stand upright or straighten right leg. Pain from buttock to ankle.

X-rayed, 15th November, 1928. Anteroposterior only, patient so bulky that nothing seen with lateral. Contralateral scoliosis with joints badly fluffed. Diathermy and galvanism alternate days, with immediate relief. After 3 weeks no symptoms, walks easily without stick. Diathermy and galvanism bi-weekly for a month, and then weekly for 3 months. Returned home. Radiographed 2 months later: joint outlines markedly clearer. Is leading an active life, entirely free from pain.

Technique.

For the information of those of our readers who may be inclined to check our results and adopt our line of treatment, we give the following brief description of the technique used by us:—

Diathermy.—The instrument used is the Victor vario-frequency Diathermy Unit made by the Victor *X*-ray Corporation, Chicago. Treatment can be given either in the sitting or the recumbent position as the convenience of the patient dictates. The electrodes used are made from lead- or tin-foil (the wrappers of photographic films serve admirably for the smaller ones). The "indifferent" electrode is large, at least 6 inches square, preferably 6 by 8 inches, and is placed upon the abdomen, while the "active" electrode which measures about 3½ by 2½ inches, is placed snugly over the area of interest, the centre of which corresponds roughly to the posterior inferior iliac spine. The electrodes are secured in position by a rubber bandage which should be as tight as the patient can tolerate without discomfort, for intimate contact is essential, if prickling and burns are to be avoided as the current rises.

The current is then turned on, and *gradually* increased till the limit of the patient's tolerance is reached, when it is maintained for 10 minutes and then *gradually* decreased.

The application may be summarized as "five minutes going up, ten minutes at the top, five minutes coming down."

Soon after the current is turned on, the patient experiences a sensation of warmth which is not unpleasant and which increases as the current rises. The summit is reached when the sensation of warmth gives place to one of burning, when the current is slightly decreased and there maintained.

Provided the contact of the electrodes is good, no inconvenience is felt; but a loose electrode will cause a disagreeable prickling sensation, which will diminish tolerance, and the summit will be lower than could be borne with good contact.

Regarding tolerance, the highest level borne with comfort by any patient in our series has been 1,750 ma. (*Case* I).

Usually the tolerance rises with treatment; at the beginning 1,000 ma. is the average limit, while later currents up to 1,400 and 1,500 ma. are borne with comfort.

The higher the tolerable maximum the quicker and more marked the relief; and, fortunately, sciatica patients are so anxious for easement that they are not nervous, while they appreciate the warmth generated by high frequency current.

Galvanism.—Here the instruments used by the writers have been variously a Watson pantostat, a Newton and Wright pantostat, and a Victor multiple wave generator, in each case connected to the main supply, the instrument imposing the necessary resistance. The anode is connected to a foot bath, while the kathode, moistened with saline, is applied to the site of interest as in the active electrode in diathermy. The current is then switched on, and gradually increased up to the amount which it is desired to give, usually about 5 ma. As for diathermy, the increase and decrease is gradual, and the time occupied by treatment does not as a rule exceed 20 minutes.

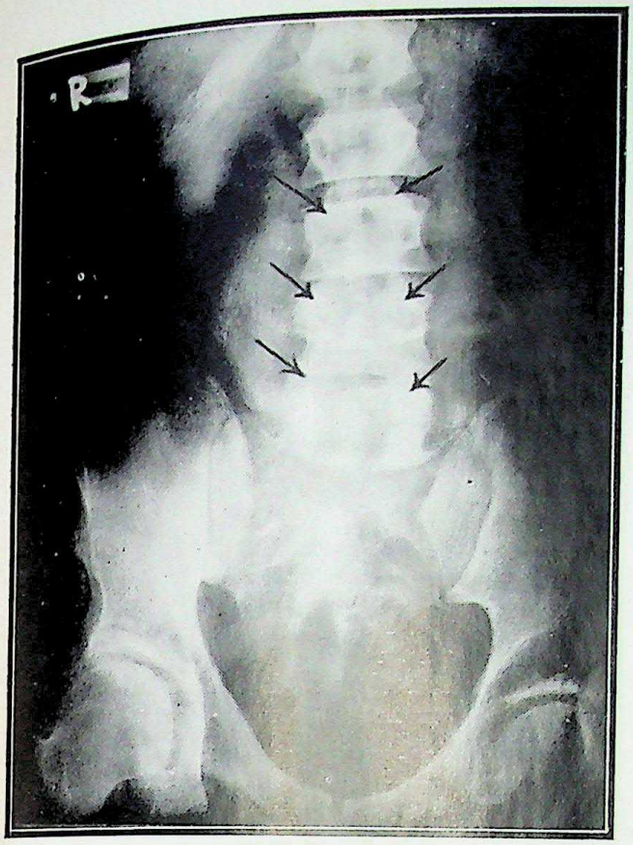
Discussion.

Through the kindness of the Director, Central Research Institute, Kasauli, the senior writer was enabled to look up the recent literature on sciatica in the fine library of the Institute. He could only discover two references to the use of electrotherapy in sciatica. The first was by Kowarschik in a Berlin paper and was not available, while the second was by Dattner (1927) of Vienna in which that author states that of recent years electrotherapeutics, and especially galvanism, have gained for themselves a permanent place among therapeutic agents; and he prophesies that they will be more extensively used because of their surprisingly rapid action. More recently O'Meara (1929) mentions that electricity in the form of galvanism and diathermy has been successful in obstinate cases.

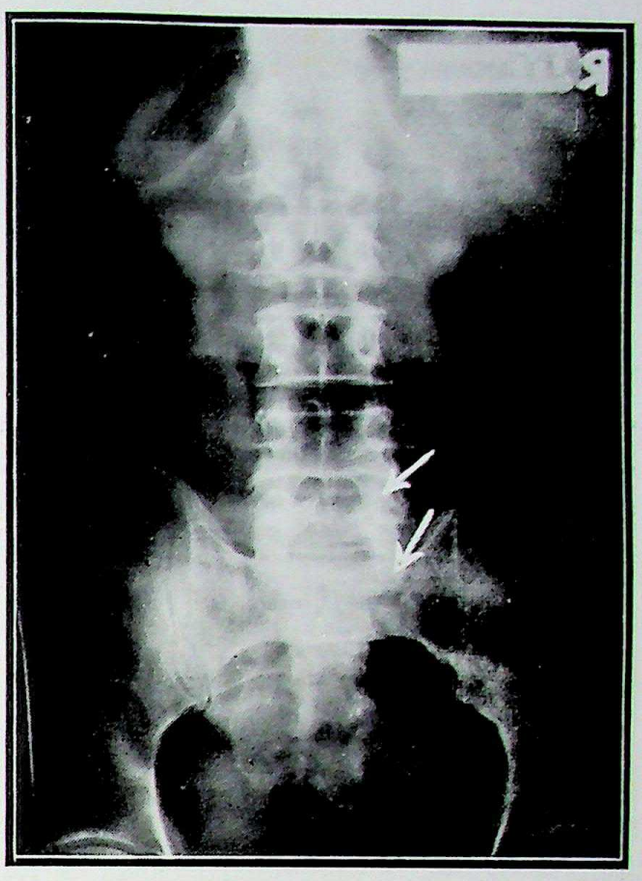
It is apparent, therefore, that others besides the present writers have successfully treated sciatica with diathermy and galvanism, though they can find no reference in the literature to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

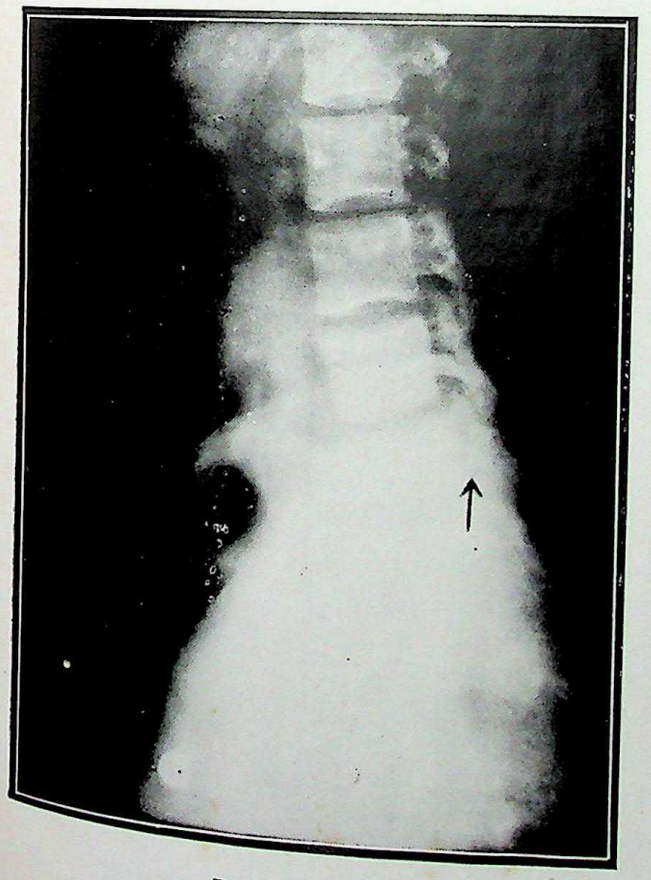
Digitized by Arya Samaj Foundation Chennai and eGangotri



RADIOGRAM 9.



RADIOGRAM 11.
Arrows accidently wrongly disposed. Placed on right instead of left. Note stone in right kidney.



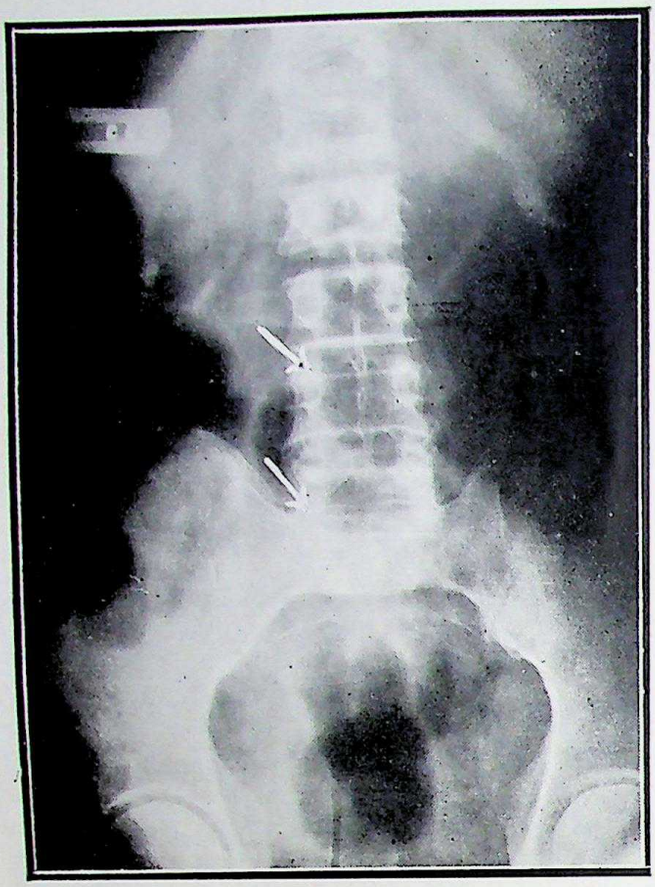
RADIOGRAM 10.

RADIOGRAM 12.

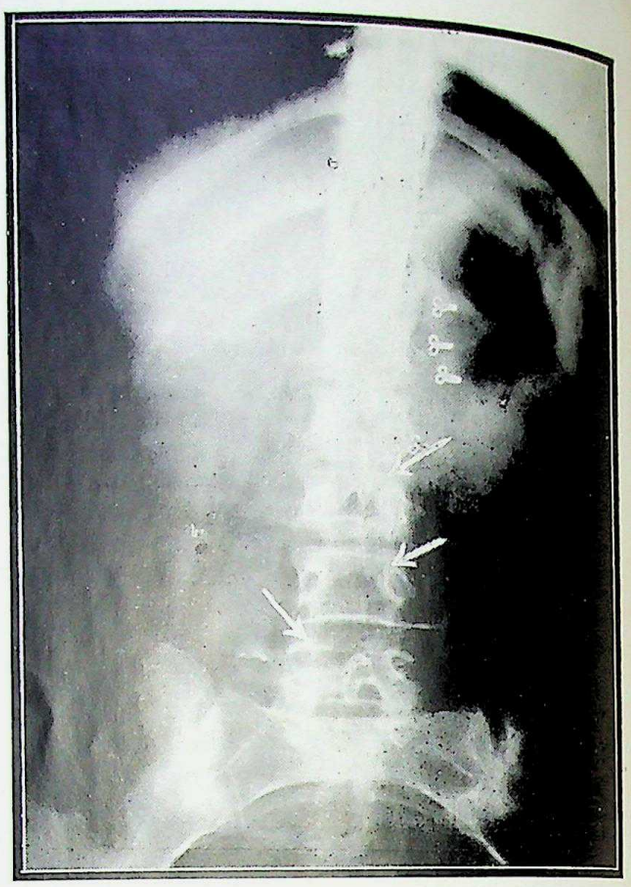
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

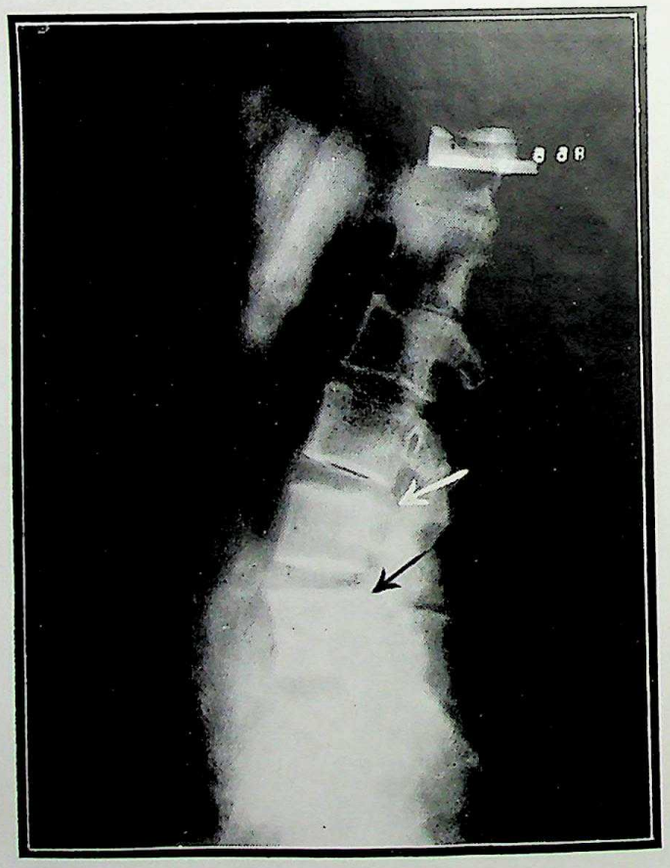
PLATE IV.



RADIOGRAM 13.



RADIOGRAM 14.



RADIOGRAM 15.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the checking of the efficacy of these agents by serial radiograms, and their curative—as opposed to palliative—effect recorded. Consequently they do not feel that they can claim originality for this article; nor do they consider the point of any importance compared with the main object in publishing it, which is to bring before the profession in India a line of treatment which has enabled them to give relief—and, they hope, permanent relief—to a number of sufferers from a hitherto most intractable complaint.

The writers desire to record their great sense of obligation to the Victor *X*-ray Corporation of Chicago, and especially to their Bombay representatives, who have been of the greatest assistance, not only in preparing the blocks of the radiograms herewith reproduced, but in supplying advice which has been of the utmost value in developing technique, both radiological and therapeutic.

Summary and Conclusions.

(1) The present series of cases tends to confirm Putti's claim that idiopathic sciatica is caused by an infective arthritis of the lumbar intervertebral articulations, with or without "anomalies of tropism."

(2) The physical signs of the conditions are identical, *mutatis mutandis*, with those of infective arthritis elsewhere.

(3) Diathermy, in association with "negative" galvanism, gives excellent immediate results both as regards relief of symptoms and amelioration of their causal arthritis; and if, as seems probable, its promise of permanent relief be fulfilled, it would appear to be the treatment of choice, since it is available to all classes of case within the reach of a radiological department, and, moreover, is free from the inconvenience to the patient which is inseparable from any form of retentive appliance.

(4) The search for, and if possible eradication of, the infective focus or foci is a most important step in the treatment of the condition, and should not be overshadowed by the more spectacular results of physiotherapy.

REFERENCES.

Dattner, B. (1927). *Wien. Klin. Wochenschr*, XL, 687, May 26th.

O'Meara, E. J. (1929). *Medical Guide and Index of Treatment*, 3rd Edition. Butterworth & Co.

Putti, V. (1927). New Conceptions in the Pathogenesis of Sciatic Pain. *Lancet*, II, 53, July 9th.

Tabular Summary of Cases.

Serial No.	Name.	Class, sex and age.	Date.	Complaint and duration.	*X*-ray findings.	Treatment.	REMARKS.
1	Mr. C. H. W.	E. M. 48	Sept. 1927.	Recurrent left-sided sciatica, 6 attacks in 10 years. Later attacks had crippled him.	5-11-1927. Obliteration of articular outline 4th and 5th lumbar intervertebral joints. Partial filling 4th lumbar foramen. 5th foramen filled with exudate, contralateral scoliosis. 5-2-1928. Joint outlines reappearing. 4th lumbar foramen nearly clear. 5th clearing. Scoliosis less. 11-5-1928. Joints and foramen clear. No scoliosis.	Diathermy and negative galvanism. *B. flexner* autogenous vaccine.	Complete relief except for twinge in May 1929 when constipated, which disappeared with purge.
2	Mr. H. S. H.	E. M. 40	Nov. 1927.	Right-sided sciatica 4 days. Slight attack winter 1926-27.	Contralateral scoliosis. Fluffing of joints and foramina.	Diathermy and negative galvanism. Non-hæmolytic streptococcus autogenous vaccine from dental focus.	Complete relief.
3	Mr. J. P.	E. M. 40	Jan. 1928.	Acute left-sided sciatica following jump.	Homolateral scoliosis. Fluffing of joint outlines. Filling of 4th and 5th foramina.	Diathermy and negative galvanism. Non-hæmolytic streptococcus vaccine from dental focus.	Complete relief.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Tabular Summary of Cases—Contd.

Serial No.	Name.	Class, sex and age.	Date.	Complaint and duration.	X-ray findings.	Treatment.	Remarks.
4	G. J.	H. M. 35	Jan. 1928.	Left-sided sciatica for 15 years off and on. Lumbago constant.	Fluffing of joint outline, filling of 4th and 5th foramina. Partial obliteration of 3rd. Contralateral scoliosis.	Diathermy and galvanism. N. A. B. Bismostab.	Wassermann positive. Discharged against advice after 4 weeks alleging complete relief not since traced.
5	K. A.	M. M. 45	Feb. 1928.	Right-sided sciatica 3 weeks.	Fluffing of joint outlines right side. Blurring of 4th foramen, obliteration of 5th.	Diathermy and galvanism.	Discharged after 1 month alleging complete relief. X-rays showed restoration of outline of joints and foramina. Not since traced.
6	K. K.	M. M. 67	Feb. 1928.	Right-sided sciatica 1 year.	Fluffing of joints between 3rd, 4th and 5th lumbar and sacrum. Constriction of 4th and 5th foramina.	Diathermy and galvanism. Short - chained non-hæmolytic vaccine (isolated from urine).	Discharged completely relieved. Not since traced.
7	A. G.	M. M. 40	March 1928.	Right-sided sciatica every cold weather for years. Lumbago constant.	Fluffing of 3rd, 4th and 5th lumbar joints. Homolateral scoliosis.	Diathermy and galvanism. Vaccine of "short-chained" non-hæmolytic streptococcus from dental focus.	Complete relief.
8	S. L.	H. M. 30	March 1928.	Right-sided sciatica, 25 days. Following on appendicectomy.	Contralateral scoliosis. Tropism of 4th right lumbar joint anomalous, 5th joint outline fluffed, filling of 4th and 5th foramina.	Diathermy and galvanism.	Complete relief.
9	N. M.	M. M. 45	March 1928.	Left-sided sciatica 15 days.	Fluffing of 3rd, 4th and 5th lumbar joints with filling of foramina. Contralateral scoliosis.	Diathermy and galvanism. Autogenous short - chained streptococcus vaccine from dental focus.	Discharged against advice after 3 weeks alleging himself cured.
10	Mrs. S. N. M.	H. F. 23	March 1928.	Alternating sciatica. 4 months.	Fluffing of 4th and 5th joints both sides and 3rd joint right side. Filling of 3rd, 4th and 5th foramina. 15-5-1928. Joints clear. 3rd and 4th foramina clear. 5th almost clear.	Diathermy and galvanism.	Leucorrhœa. Retroversion uterus, erosion of cervix. Complete relief.
11	M. S.	M. M. 65	April 1928.	Left-sided sciatica intermittent 1 year.	Fluffing of 3rd, 4th and 5th lumbar joints. Constriction 4th and 5th foramina. Stone right kidney. 11-5-1928. Joints much clearer.	Diathermy and galvanism.	Declined nephrolithotomy. Left against advice after 1 month's treatment, alleging himself cured.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Tabular Summary of Cases.—concld.

Serial No.	Name.	Class, sex and age.	Date.	Complaint and duration.	X-ray findings.	Treatment.	Remarks.
12	S.	H. F. 40	April 1928.	Left-sided sciatica. 3 weeks.	Homolateral scoliosis. 3rd, 4th and 5th joints fluffed on left side. 4th and 5th foramina constricted and obliterated respectively.	Treatment declined.	Unrelieved.
13	Mrs. P.	H. F. 35	April 1928.	Intermittent alternating sciatica for some years.	No scoliosis. Fluffing of all lumbar intervertebral joints 4th and 5th lumbar foramina narrowed.	Diathermy and galvanism. *B. coli* vaccine from urine.	Discharged against advice after a month, alleging himself cured.
14	G. L.	H. F. 40	May 1928.	Right-sided sciatica.	Contralateral scoliosis. 4th and 5th joints fluffed. 4th and 5th foramina constricted.	Diathermy and galvanism. N. A. B. Bismostab.	Wassermann positive. Discontinued treatment after 6 weeks being free from symptoms. Not since traced.
15	Z. S.	H. M. 20	Nov. 1928.	Right-sided sciatica.	15-11-1928. Antero-posterior only. Contralateral scoliosis. Joints badly fluffed. Outlines much clearer.	Diathermy and galvanism.	Complete relief. Is leading active life. Weighs 20 stone.

WEBSTER'S OPERATION FOR ENTROPION OF THE UPPER LID.

By R. E. WRIGHT, C.I.E., M.D.,
LIEUTENANT-COLONEL, I.M.S.,
Superintendent, Government Ophthalmic Hospital, Madras.

It needs no apology on my part to claim the attention of those readers of the *Gazette* who are interested in ophthalmology to the above procedure, if amongst them there is anyone to whom it is unfamiliar. The operation mentioned in the title was described by MacRae in the *British Journal of Ophthalmology*, January 1928. It was devised by Webster in Beyrout over thirty years ago, but apparently had remained comparatively unknown, although no doubt similar procedures were employed in various parts of the world from time to time. As MacRae points out, numbers of different methods have been devised of operating for the relief of entropion of the upper lid, but this is "superior to them all." He described it in the hope that "what he considered the best operation for this condition" might find its way into the textbooks and displace many of the old (some of them barbarous and mutilating) procedures which are still described. He goes on to say that the operation is practically "fool-proof," even should it fail no harm is done, but in his hands it has been uniformly successful. When one considers the number of procedures described in the textbooks for this condition, the claims which the author makes for this operation seem almost too good to be true. When I read MacRae's article, this was my first impression, but the author's simple dogmatic statements were somehow convincing and I determined to give it a trial; for, after a considerable experience of other operative measures for the relief of entropion of the upper lid, I had come to the conclusion that there was not one of them really satisfactory in hospital practice. Over a year's experience of the method has convinced me that the claims made by MacRae are fully justified, and in the interests of ophthalmological science, I consider that any surgeon who does not know the operation ought to become familiar with it. A really good method of treatment such as this can bear repetition in the medical press in order to emphasize its value just as a bad procedure deserves criticism. Dr. Webster deserves great credit for its evolution, and although MacRae claims no share in having invented the operation, he justly merits the thanks of ophthalmologists for having brought it to notice.

For the convenience of those who have not got ready access to the paper above quoted perhaps I cannot do better than give the essentials of the technique in the author's own words.

"A Snellen's entropion clamp is used reversed: the left-sided clamp being used for the right eye and *vice versa*. The flat plate of the clamp is applied to the skin

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

surface of the lid, the open arm to the conjunctival surface, and the lid everted. The outer end of the lid is grasped with toothed forceps and pulled outwards until the punctum is just visible in the portion of the lid included in the clamp. The clamp is then screwed tight. An incision is now made in the conjunctival surface of the lid parallel to the lid margin and about 3 mm. from it. This incision goes from end to end of the lid and goes right through the tarsal plate. It is not advisable to go so deep as to button-hole the skin surface but no great harm is done if this accident happens. The important point is that the tarsal plate must be completely divided. At each extremity of the lid the incision is curved a little forwards *towards* the lid margin, but it must stop short of the actual margin, or the cosmetic result will not be so good. At the inner extremity this forward curve should end just external to the punctum. It may not be possible, even if a large clamp is used, to complete the outer end of the incision without moving the lid in the clamp, but this is easily done by grasping the lid with toothed forceps, the clamp being slightly slackened meanwhile.

"On completion of the incision the wound is carefully inspected to see that no hair roots have been left in the proximal part of the lid. If the incision is made 3 mm. from the border there should be none; but if at any point it has got too near some may be left and in any case it is wise to look for them. If any are seen they are carefully dissected out.

"The clamp is now removed; the lid is replaced and a large moist pad pressed on it. Bleeding is at first free but has stopped by the time it is necessary to proceed with the final stage of the operation on the lid.

"If both eyes are affected the other lid is incised in the same way and in its turn covered with a pad.

"The inner surface of the lower lip is now cleansed by an assistant and held everted. The operator picks up a point of mucous membrane towards the angle of the mouth with toothed forceps held in his left hand, and with scissors, preferably curved on the flat, rapidly cuts a strip of mucous membrane of somewhat more than the length of his lid incision and 4 mm. or 5 mm. broad. The wound in the lip is immediately sutured by an assistant with a continuous suture. If no assistant is available it may be clamped and dealt with later. The strip of mucous membrane is now laid on the palmar surface of a finger of the operator's left hand, raw surface exposed. From the raw surface the fat and submucous tissue are carefully removed, with iris scissors curved on the flat, until the strip is so thin that it is difficult to tell which surface is which. This is the most troublesome and tedious part of the operation, as it is easy to button-hole the delicate graft, and so render it useless, necessitating the cutting of another graft. It is important to perform it thoroughly, as the thinner the graft the better apposition can be got with it, and the more certain it is to 'take.' When sufficiently thin its sides are trimmed parallel and the ends pointed. The graft may now be transferred, till wanted, to a bowl of warm saline lotion or may be kept on the finger if the operator is not likely to forget it and let it be rubbed off during the next stage. Keeping it on the finger with the raw surface exposed saves one straining one's eyes later on to make out which is the raw surface.

"The pad is now removed from the eye, blood wiped away and the lid everted. The line of the incision will be found filled with clot. The bulk of this is very gently removed by forceps or by swabs so as not, if possible, to restart the hæmorrhage. The graft is then placed in position, convenient instruments for this purpose being a pair of fine-pointed, light, dissecting forceps and an iris repositor. If found to be too long it is shortened. Finally, it should lie in, and covering the groove made by the incision, the pointed ends lying in the two curved ends of the groove, care being taken that it is pressed well down on to the lid and that its edges are not curled in. It does not matter if the sides of the graft overlap the sides of the groove, in fact it is probably better that they should; but the *points* must lie in the groove, as otherwise they are apt to get out of position on closing the eye. If any bleeding has restarted on removing the clot, it will cease as soon as the flap is in position.

"The lid, which has been everted, is now gently replaced. The lid margin is then cautiously raised with the finger and the conjunctival surface inspected to make sure that the graft has not been displaced in the act of replacing the lid. If it has, it is smoothed into position by the iris repositor without again everting the lid. A pad and bandage are then applied."

Possibly every surgeon of experience will vary the details to suit his fancy. MacRae does not carry out the various steps of the operation exactly as demonstrated to him by Webster, but this is a small matter.

MacRae uses general anæsthesia. I personally prefer local anæsthesia. The fact that local anæsthesia is satisfactory places the operation within the reach of numbers of operators who would not otherwise adopt it for want of time or assistance. An infiltration of the upper lid with 2 per cent. novocaine containing a drop or two of adrenaline per c.c. and a similar infiltration of the submucous tissue of the mouth opposite the lower incisors on the side from which it is proposed to take the graft, gives excellent anæsthesia. As a dressing I use a piece of lint well smeared with boracic ointment and change it once or twice in the first six days without disturbing the eye. On the seventh day the eye is released.

It would only confuse the issue to mention other modifications adopted here. They are not essential. The operation can be employed in eyes mutilated by other methods, e.g., where there is shortage of palpebral conjunctiva and drawing up of the upper lid.

MATERNAL MORTALITY IN INDIA: A PRELIMINARY STUDY.*

By CAPTAIN N. R. UBHAYA, L.R.C.P. & S., D.P.H.,
Acting Director of Public Health, Madras Presidency,
and
R. ADISESHAN, B.S.SC., DIP. HYG. (Camb.),
Assistant Director of Public Health, Madras.

A DIFFICULTY frequently experienced by the public health officials and workers in charge of maternity relief and child-welfare organizations in this country is in getting reasonably correct statistics of maternal mortality. The extraordinary variations in the maternal death-rates recorded in the different provinces and in cities in the same province are so incredible that little value can be attached to these figures. The following is an example:—

TABLE I.

	Variation in Maternal Death-rates in 1925.
(a) Provinces—Bengal, Bombay, Central Provinces and Madras ..	2.03 to 5.27
(b) Cities in United Provinces ..	3.0 to 17.5
(c) " in Madras Presidency	9.0 to 32.8
(d) " in Bombay ..	5.8 to 53.2
England and Wales ..	3.6 to 4.3

* Being a paper read at the Medical and Veterinary Section of the Indian Science Congress held at Madras in January 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The causes of these abnormal variations are:—

(a) Maternal mortality rates being expressed as a ratio to live births, the rates will be inflated or lowered to the extent of the defects in the enumeration of births and maternal deaths respectively.

(b) Errors in the compilation of returns resulting from the registrar's ignorance of the nomenclature of diseases—hæmorrhage and eclampsia for example being classified as "other causes."

(c) Under the existing rules, it is only those deaths that occur during or within 14 days of child-birth that are assigned to maternal mortality. This is a very serious cause of under-statement. For instance, in the investigation of puerperal mortality registered in Saxony during the period 1901 to 1904, it was found that only 70 per cent. of deaths occurred in the first two weeks, the corresponding ratio in the present investigation being approximately 60 per cent.

When the total maternal mortality statistics are so defective, it is almost impossible to determine the share of the several diseases responsible for the mortality. In order to surmount this difficulty, attempts have been made from time to time to get this information by indirect methods. One of these is by applying to the general population the experience of maternity hospitals. This method, however, is open to serious objection as the hospital population is an adversely selected one.

The method commonly adopted by the Public Health Department of this Presidency is based on the trend of mortality in the two sexes at different ages. Unlike the case in other countries, the death-rate in women in the ages 15 to 30 in this Presidency, and probably in the rest of India, is markedly higher than in men; in the other age periods, the male mortality is higher as in other countries. This may be seen from the following statement:—

TABLE II.

ENGLAND AND WALES. 1926. MADRAS PRESIDENCY.

DEATH-RATE PER 1,000 POPULATION IN THE AGE INTERVAL.

Ages.	Male.	Female.
0—5	23.34	18.77
5—15	2.01	1.86
15—25	2.79	2.65
25—35	3.70	3.32
35—45	6.12	4.64
45—55	11.07	8.19
55—65	23.31	17.41
65—75	56.84	43.89
75 and above	147.49	126.27

DEATH-RATE PER 1,000 POPULATION IN THE AGE INTERVAL.

Ages.	Male.	Female.
0—5	87.23	78.01
5—10	9.5	8.9
10—15	5.7	5.6
15—20	8.2	11.8
20—30	10.2	12.0
30—40	12.7	12.6
40—50	18.6	14.5
50—60	29.4	24.8
60 and above	75.4	75.4

In the absence of any other causes excepting greater risks of maternity to explain the higher incidence of mortality in the ages 15 to 30, it is presumed that the excess mortality in women represents maternal deaths. Even then, these figures are an under-statement as no allowance is made for the greater viability of the female in these ages as in other ages and for maternal deaths in the ages 10 to 15 and 30 and above.

As such estimates are after all attended with the risk of a certain amount of speculation, an investigation was started in order to determine by actual field study the maternal mortality rate and the various factors associated therewith as they obtain under ordinary conditions. This paper is a summary of the preliminary statistical analysis of the histories of over 7,000 confinements registered in Madras, Madura, Trichinopoly and Coimbatore during the period October 1927 to September 1928. These confinements correspond approximately to a population of 183,000, the great majority being Hindus who form the preponderating element in this Presidency. The field work was entrusted to members of the Public Health Department of these four cities chosen in consultation with the Health Officers. The different points on which information was elicited are shown in the questionnaire form, published as an appendix. Apart from the fact that the population under enquiry consisted of Hindus and is mainly urban in character, the only other selection, if it can be considered a selection at all, consisted in confining the investigation to such portions of the cities which, on account of their compact situation, facilitated the conduct of investigation. Subject to the limitations inevitable in a field study of the present kind, the results of the preliminary statistical analysis are briefly discussed below:—

(i) *Age at the time of Confinement.*—Out of 7,324 confinements one was at the age of 12, four at age 13, and 38 at the age of 14. The proportion of confinements below 15 was 0.59 per cent. One of the items of information ascertained in the present investigation in the case of confinements under 18 years of age was the age of the mother at the time of consummation of marriage. In some instances, information of this has been furnished even for higher ages. The sub-joined

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

statement compiled from nearly 900 consecutive cases in which the last confinement was below 20 years of age gives an idea of the proportion of marriages at the earlier ages:—

TABLE III.

Mother's age at consummation of marriage.	Number of marriages.	Proportion per cent. to Total.
12	120	13.82
13	153	17.63
14	192	22.11
15	215	24.77
16	116	13.36
17—19 ..	72	8.29
Below 20 ..	868	99.98

Although early marriages are fairly frequent, it is a matter for surprise that the ratio of confinements below 15 to the total at all ages is only 0.59 per cent.

The ratios of confinements in the different ages to the total are shown in the following statement:—

TABLE IV.

Age interval.	Number of confinements.	Proportion to Total.
Under 15 ..	43	0.59
15—19 ..	1,811	24.73
20—24 ..	2,289	31.25
25—29 ..	1,748	23.87
30—34 ..	934	12.75
35 and above ..	499	6.81
All ages ..	7,324	100.00

(*ii*) *Plural Births.*—These amounted to just 1 per cent. of the total confinements. Excepting one triplet, the rest were twins.

(*iii*) *Proportion of Normal and Abnormal Confinements.*—For purposes of this investigation, it is only those confinements in which instrumental delivery or other surgical interference was necessary, that are classified as abnormal. The proportion of these to the total at all ages was 3 per cent. The maximum was in the ages 15 to 24 and 30 to 34 and the minimum in the age period 25 to 29 (excluding the ages under 15 in which the proportion was nil).

TABLE V.

Age period. (1)	Total confinements. (2)	Number of abnormal cases. (3)	Ratio of column (3) to (2). (4)
Under 15 ..	43	0.0	0.0
15—19 ..	1,811	63	3.47
20—24 ..	2,289	79	3.45
25—29 ..	1,748	37	2.12
30—34 ..	934	29	3.10
35 and above ..	499	14	2.81
All ages ..	7,324	222	3.03

In the experience of the Madras Government Hospital for Women and Children, the proportion of instrumental deliveries during 1910—27 varied from 7 to 14.7 per cent., the corresponding figure in the Norway Hospitals for the year 1917-18 being 3.48 per cent.; the latter figure conforms more or less with the rate arrived at in the present investigation.

Ordinarily, on account of defective registration of still births, the maternal death-rate is represented as a ratio to every 1,000 live births. In the present investigation, however, the number of confinements at risk being definitely known, the death-rate has been calculated with reference to the total births including still births.

Among the 7,324 confinements, there were 131 deaths directly or indirectly attributed to child-birth. This corresponds to a maternal death-rate of 17.89 per 1,000 births. This is in marked contrast with the corresponding rates in other countries:—

TABLE VI.

Countries.	Maternal death-rate per 1,000 live births.
Cities under investigation (1927-28)	18.45
Denmark— 1920	2.35
Holland „	2.42
Sweden „	2.58
Japan „	3.53
Union of South Africa ..	4.10
England and Wales	4.33
Germany— 1920	5.15
France „	6.64
U. S. A. (White) 1921	7.99

Maternal mortality in relation to still births.—In confinements which resulted in still births, the maternal death-rate was 90.36 as compared with 16.20, the death-rate per 1,000 confinements which resulted in live births.

Maternal Mortality according to age at Confinement.—The mortality rate is highest when confinement occurs before 15 years of age, and drops by nearly 50 per cent. in the ages 15 to 19. In the ages 20 to 24, the death-rate corresponds to the rate at all ages. Details for the different age periods are shown in the following statement:—

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE VII.

Age.	Number of confinements.	Deaths.	Death-rate per 1,000 confinements.	Deaths at all ages: 100. Proportionate mortality figures.
Under 15	43	2	46.51	260.03
15—19	1,811	43	23.74	132.73
20—24	2,289	41	17.91	100.13
25—29	1,748	25	14.30	79.95
30—34	934	13	13.92	77.82
35 and above	499	7	14.06	78.61
	7,324	131	17.89	100.00

The comparative risks of maternal mortality at the different age intervals will be more readily seen from the last column of the statement, the mortality at all ages being taken as 100.

For purposes of comparison, the age period maternal death-rates in the U. S. A. for 1921 are shown in Table VIII.

Order of Confinement.—This appears to exercise a marked influence on maternal mortality. The risk to the mother at confinement is at its maximum in the first birth order, the mortality-rate being nearly twice that in all birth orders and is at its minimum in the second and the sixth confinements. The maternal death-rates in the different birth orders are shown below:—

TABLE VIII.

Maternal death-rates per 1,000 births.	Under 15	15-19	20-24	25-29	30-34	35 39	40-44	45 and above.
	20·0	6·8	5·0	5·6	7·4	10·3	13·1	19·2

TABLE IX.

Birth order.	Confinements.	Deaths.	Death-rate per 1,000 births.
First ..	1,553	51	32.84
Second ..	1,364	13	9.53
Third ..	1,223	24	19.62
Fourth ..	953	12	12.59
Fifth ..	771	13	16.86
Sixth ..	491	4	8.15
Seventh ..	414	4	9.66
Eighth ..	233	5	21.46
Ninth and above	212	5	23.58
TOTAL ..	7,324	131	17.89

The corresponding figures for New South Wales in this connection may be found to be of interest:—

TABLE X.

Maternal Mortality Rates. By Order of Birth: New South Wales, 1893—1898.

Order of birth.	Maternal mortality per 1,000 births.
First	8.82
Second	4.40
Third	5.11
Fourth	5.27
Fifth	6.60
Sixth	6.19
Seventh	7.34
Eighth	8.71
Ninth	10.52
Tenth	9.02
Eleventh	9.06
Twelfth	14.12
Thirteenth	14 01
Fourteenth and over	7.70

Maternal mortality according to Age and Birth Order.—It will be seen from the two preceding paragraphs that the maternal death-rate is highest in the first birth order and in ages under 15. From this, a very pertinent remark may be raised, viz., that the high death-rate in early ages is due not so much to age as to the order of confinement, the great majority of confinements in the earlier ages being first confinements. This argument does not, however, seem to be in consonance with the results of the present enquiry as may be seen from the following statement:—

TABLE XI.

PRIMIPARÆ.

Age.	Maternal death-rate per 1,000 births.
Under 15	51.28
15—19	33.04
20—24	30.69
25—29	27.78
30 and above	45.45
All ages	32.84

It appears therefore that the risk to the mother at the first confinement is greatest when it occurs before the age of 15 and it is almost as dangerous at the age of 30 and later.

As regards the second and later confinements, there does not appear to be any correlation between the birth order and the age of the mother at confinement.

Cause of Death.—Sepsis and septicæmia (a large part of which is preventable) caused nearly

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

60 per cent. of the total mortality. Eclampsia and difficult labour caused about 9 per cent. and 8 per cent. of the deaths:—

TABLE XII.

Causes of death.	Number of deaths.	Percentage of Total.
Puerperal sepsis and septicæmia	77	58.78
Eclampsia	12	9.16
Difficult labour	11	8.40
Hæmorrhage	5	3.82
Other causes	26	19.84
	131	100.00

Attendance at Labour.—For purposes of the present study, confinements which at any stage were handled by untrained midwives are classified as such, although skilled aid might have been summoned at a later stage. According to this grouping, the proportion of confinements attended by trained agency was 36.37 per cent. and by untrained agency 63.63 per cent. These figures for four of the most important cities of the Presidency are ample proof of the insufficiency of skilled maternity aid for attendance at confinement.

A most disconcerting feature in the present study is the maternal mortality rate in the cases attended by trained midwives. Until a more detailed analysis is made, it is not possible to state whether this feature is due to a larger proportion of abnormal and complicated cases in this group or to any other cause. No definite conclusion can therefore be drawn at the present stage.

Economic Conditions.—A rough classification of the confinements was made according to the income of the households. The results are shown in the following tables:

TABLE XIII.

Average household monthly income.	Number of confinements in the group.	Maternal death-rate per 1,000 confinements.
Under Rs. 25 ..	3,200	19.06
Rs. 25—49 ..	2,750	17.09
Rs. 50 and above	1,274	18.05

According to this grouping economic factors do not seem to influence maternal mortality.

Besides maternal mortality, the present investigation was utilized to collect information regarding still births and neo-natal deaths. The results of the analysis are set forth below:—

(*i*) *Still Births.*—Among the confinements analysed, there were 7,176 live births and 166 still births. The proportion of the latter to the former is 2.31 per cent. The rate of still births appears to be at its highest when the mother's age is 15 to 19 and 30 and above. Details are shown in the following statement:—

TABLE XIV.

Age group.	Live births.	Still births.	Proportion of still births to 100 live births.	
Under 15 ..	43	0	0	
15—19 ..	1,771	47	2.65	2.59
20—24 ..	2,248	46	2.05	
25—29 ..	1,722	29	1.68	
30—34 ..	909	29	3.19	
35 and above ..	483	16	3.31	
All ages ..	7,176	166	2.31	

In relation to birth orders, the ratio of still births to live births is lowest in the third birth order. There is a progressive decline in the ratio from the first to the third birth orders, after which there is a steady increase.

TABLE XV.

Birth order.	Ratio of still births to 100 live births.
First	2.51
Second	2.40
Third	1.66
Fourth	2.03
Fifth	2.39
Sixth and above	2.74
Total for all Birth Orders ..	2.31

(*ii*) *Neo-Natal Mortality.*—As all the children in the present investigation were exposed to risk of dying during the first month of their existence, neo-natal mortality in some of its aspects may be considered.

Out of 7,176 children born alive and with respect to whom information regarding survival or death has been furnished, 780 died in the first month of life. This represents a neo-natal mortality rate of 108.70. As approximately 50 per cent. of infant mortality occurs within the first month of life, this neo-natal rate of 108.70 corresponds to an infant mortality rate of 217.40 per 1,000 live births.

The incidence of mortality of infants is at its maximum in the first birth order and when the mother is under 20 years of age. It decreases in the later birth orders and as the age of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

mother at confinement increases. The details are shown in the following two statements:—

TABLE XVI.

Neo-natal Mortality in Relation to the Age of the Mother.

Age of the mother.	Live births.	Neo-natal deaths within one month.	Death-rates per 1,000 births.
Under 15 ..	43	8	186.05
15—19 ..	1,771	227	128.17
20—24 ..	2,248	240	106.76
25—29 ..	1,722	173	100.46
30—34 ..	909	88	96.81
35 and above ..	483	44	91.10
All ages ..	7,176	780	108.70

TABLE XVII.

Neo-natal Mortality as per Birth Order of the Child.

Birth order.	Live births.	Deaths within one month.	Death-rate per 1,000 births.
First ..	1,515	231	152.48
Second ..	1,332	144	108.11
Third ..	1,203	110	91.44
Fourth ..	934	86	92.08
Fifth ..	753	75	99.60
Sixth ..	485	47	96.91
Seventh and above.	954	87	91.19
All orders ..	7,160	780	108.70

(*iii*) *Economic Conditions.*—Unlike maternal mortality, neo-natal mortality seems to be influenced to some extent by economic conditions. The death-rate per 1,000 births in the first month of life was 120 in families whose income was below Rs. 25 per mensem, 105 when the income was between Rs. 25 and 49, and 84 when the income was Rs. 50 and above.

Conclusions.

From a preliminary statistical analysis of 7,324 confinements in four cities in Madras Presidency, the following conclusions are established:—

(1) Although marriages before the age of 15 are of frequent occurrence, the number of confinements occurring before this age comprises only 0.6 per cent. of the confinements at all ages.

(2) The proportion of plural births was about 1 per cent. of the total.

(3) The proportion of abnormal confinements, to the extent that instrumental delivery or other surgical interference was necessary, was 3 per cent. of the total confinements.

(4) The maternal death-rate in the confinements investigated is 17.89 per thousand births, which compares very unfavourably with the corresponding figures in most other countries.

(5) The maternal death-rate in the case of confinements resulting in still births was a little over 5½ times the death-rate in the case of confinements resulting in live births.

(6) The maternal mortality is at its maximum in the earliest ages. In relation to the order of confinement, the maternal mortality rate is highest in the first confinement. Also in the first birth group, the earlier the age of the mother, the greater is the risk of maternal death. As regards the later birth orders, age does not appear to have any appreciable influence on the mortality.

(7) More than 60 per cent. of the puerperal deaths were due to sepsis and septicæmia which are preventable to a large extent.

(8) Economic conditions do not seem to have any relation to maternal mortality.

(9) Skilled maternity aid was available in only about a third of the confinements, which shows the extreme inadequacy of suitable maternity relief even in important cities.

(10) The ratio of still births to live births was 2.31 per cent. This ratio is highest at the two extremes of the child-bearing age of the mother and in the earlier and in the later birth groups.

(11) The mortality rate among infants in the first month of life was 108.70 per 1,000 births.

(12) The incidence of neo-natal mortality is greatest in the first birth order when the mother is under 20 years of age.

(13) Economic conditions seem to have an inverse relationship to neo-natal mortality.

It should be pointed out that in the present analysis, the relationship of two variables alone has been considered.

It is proposed to continue the enquiries for another year in these four cities and to start similar investigations in other places (urban and rural) in order to get a more representative sample of the population which will ensure greater accuracy when the detailed statistical analysis is undertaken. The present enquiry being probably the first of its kind in this country as far as the general population is concerned, it would be of great advantage if investigations on more or less similar lines are carried out in other parts of the country so that the results may be comparable and the schemes for the improvement of maternity relief may be worked out on more scientific lines than hitherto.

In the present investigation and the tabulation of results, the Health Officers of the four cities, Captain Hesterlow, Professor of Hygiene and his staff, and Dr. Subramanyam, Health Propaganda Officer, have been of invaluable help and our most cordial thanks are due to them.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

APPENDIX.

Form of Questionnaire.

_____ MUNICIPALITY.

_____

Birth Register No. Date of Birth	Ward or Division Street and Door No.

Child—Nationality or caste and sub-caste. Sex Male / Female	Still born / Born alive If dead, when and cause.

Father's { Name / Age

Average total monthly household income.

Mother's { Name / Age Order of birth under enquiry (I child, II, III, etc.)	If under 18, when married Total number of children born including present child. { Now alive / Dead Number of abortions, if any.

Particulars of present confinement. } 1. Normal / Abnormal 2. Attended by or in { Hospital / Doctor / Trained midwife / Untrained midwife

Condition of mother—

Before confinement.

Alive and well at present.

If ill, disease and duration.

If dead, when and cause.

Date (Signed)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MICROSCOPIC DIAGNOSIS OF MALARIA ON A GROUP OF TEA ESTATES.

By R. A. MURPHY, L.R.C.P. & S.I.,
Medical Officer, Tea Estates, Luskerpore Valley, South Sylhet.

WHILE the high spleen index, sometimes as high as 80 per cent. on most of the estates in the practice under consideration, shows that the endemicity of malaria is heavy, it is a matter for conjecture as to what extent this disease accounts for the long list of reported fever cases. An accurate and timely diagnosis by the microscope, or even by the temperature chart, of every individual patient is for various reasons not possible, communications being bad, the labour largely scattered in outgarden lines and *bastis*, and the coolies refusing to come indoors or attend regularly. Moreover, the number of films which would require examination from thirteen gardens is a serious obstacle, and for some months, under somewhat primitive conditions, microscopic work can only be done without much discomfort in the early morning hours, on account of the damp heat and the worrying attentions of *Siphonella funicola*, the eye-fly of Assam. Diagnosis, consequently, depends usually upon the sub-assistant surgeons on the estates, and one of the objects of this investigation was to ascertain to what extent the returns supplied by men of some experience, but dependent on the slight clinical evidence available, could be relied on to estimate the number of malarial cases.

Instructions were given on six estates, comprising seven gardens, that blood films should be taken from all patients showing a rise of temperature, irrespective of their complaint. These estates had joined in an anti-malarial scheme, and on most of them some field work had already been carried out, and on three of them in the Managing Agency of Messrs. Duncan Bros., where operations have been in progress some time with the advice of Dr. Strickland, a more than 50 per cent. reduction in the number of fever cases has been effected, and in some instances a very definite lowering of the spleen rate, so that the figures given below must not be taken as representing the full incidence of fever on the estates in the valley generally.

In the course of twelve months, from a population of approximately 9,000, there were 2,166 films made and examined. As there were 2,929 cases of fever returned under the heading of malaria alone, there was a disconcerting paucity of films compared with the number that should have been expected, and the discrepancy largely detracted from the value of the findings. The explanation was that a large number of coolies attended the dispensaries in the morning, and although their temperature was then normal, complained that they had suffered from fever during the night. As the coolie puts most minor ills down to *bokhar*, most of these cases probably have some small indisposition, constipation, or a headache, often well-earned, but as it is impossible to affirm fever has not been present, they are written up as malaria. An attack of the latter, it might be added, usually comes on here in the two to three hours before noon. There was also difficulty in getting films from many of the *basti* cases.

Of the 2,166 films, malarial parasites were found in 1,167. The results showed, as might be expected, that casual dispensary diagnosis is practically valueless. It was to be expected that many fevers would be called malarial which were not, but it was surprising to find the number diagnosed as other diseases which were in reality malaria. A very striking group, mostly autumnal, showing catarrhal and bronchitis symptoms, with a continued temperature of about 101°F., were logically diagnosed as influenza or feverish colds, but were found to have heavy *P. falciparum* infections. It can be argued in these and the abdominal cases that the finding of parasites is merely accidental, but judging by individual cases coming under treatment malaria is the primary cause, and the massive infections frequently found reinforce this view.

The figures from one estate, with a sub-assistant surgeon rather above the average, show how fallacious returns are—

Diagnosed malaria and parasites found	380
Diagnosed malaria and parasites not found	200
Diagnosed other diseases and parasites found	107
Diagnosed other diseases and parasites not found ..	110

Some allowance must be made for possible errors due to bad films, parasites missed, etc., but such would not materially affect the findings, for with a reasonable good thick film—and these are easier to make and not subject to the same vagaries of staining as the thin—if parasites are not seen after a ten to fifteen minutes search, malaria may be excluded with tolerable certainty as the cause of the present fever. This is not to say that there may not be an existing latent malaria. When parasites are present the possibility of some other superimposed infection must be borne in mind.

P. vivax parasites were found in 417 films, *P. falciparum* in 739, *P. malariæ* in 49, giving in round figures percentages respectively of 35, 61, 4. Crescents in 68. The preponderance of the malignant tertian species is not associated with the malignancy seen in some places. In seven years there has been no case of blackwater fever in a European, nor is the bilious remittent type of fever seen. A very occasional case of blackwater fever occurs amongst members of the educated Indian staff. Malarial coma is rarely seen. High fever with convulsions and death were formerly rather frequent in infants, but, with the inculcation of more vigorous treatment at the onset of fever, even these are becoming few, and the average infant death-rate per 1,000 births for all estates for five years is 116.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A 60 per cent. to 70 per cent. spleen index may be accompanied by a general death-rate of only 12 to 15 per 1,000. With the prevailing *P. falciparum* infection more dire effects would be expected. The coolies are for the most part old settlers, well acclimatized and must possess considerable immunity, and it is possible that recurring passage of the parasite through partially immune hosts may weaken its virulence, nor does it seem unreasonable to suppose that some immunity may be received by the child from its parents.

Films were not taken from patients returning with fever within one month, but 38 returned after a longer interval with a different species of parasite, and 47 with the same parasite. Considering that treatment was only taken while the patient was actually ill, or at the most for a few days after, the number of recorded relapses is very small. The same immunity to relapse is seen to some extent in the long-resident European, but bought with many years of ill health, and those new to infection suffer with certainty from frequent relapses, unless receiving a long course of quinine. A short course is ineffective, and experience does not bear out the results of experiments in a temperate climate. A factor in the failure of the shorter courses of quinine may be that the patient does not rest for long, and as soon as he has shaken off the fever returns to fairly arduous work, and the drug fails to be effective. Young coolie children, also presumably new to infection, would be expected as a general rule to have relapses, and their infrequency supports the suggestion that resistance to the toxins of the parasite may be inherited.

Nevertheless, malaria has far-reaching results for evil on health, and it would be a mistake to rely on treatment (supplemented by swatting mosquitoes in houses) for its mitigation. The residents on tea estates in Assam have for years enjoyed prompt and efficient treatment, better than it would be possible to make available to the general population of most malarial countries, and by this treatment malarious tracts have been rendered habitable, yet the toll is still heavy, deaths occur, miscarriages and still-births frequently originate in a bout of fever, and the loss to estates in working days is large. Moreover, even when the infection does not cause actual fever, nor incapacitate the sufferer, it is the cause of much anæmia, and lowering of vitality, both mental and physical.

The number of positive films each month was as given below. The figures for January are deceptive as 50 of these came from one estate.

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
64	17	53	54	50	93	227	192	137	135	92	53

The films were made and stained in the easy way recommended by Sinton, a thick and thin film being made on the same slide, divided by a grease pencil line, and after the addition of water to the Romanowsky stain on the thin film it is drawn over on to the thick. In these thick films young rings stain well and are true to type, but older parasites require some revision of previous views, although when sporulating are excellent, even being occasionally seen in this stage. A great help in picking up the older parasites is the pigment, which stands out sharply; the contrast in this respect to the thin film almost raises a doubt as to whether the teaching that hæmozoin is insoluble in pure alcohol is correct. In the rains a thick film may appear thoroughly dry, but if stained on the day it is taken is liable to wash off the slide. This may be avoided by very slightly warming the slide before staining.

A MALARIA SURVEY OF MADARIHAT AND ITS ENVIRONS.

By Dr. S. N. SUR, M.B. (Cal.), D.P.H. (Lond.), D.T.M. (Liverpool),
Assistant Director of Public Health, Malaria Research, Bengal,
and
Dr. BANAMALI GHOSH, M.B. (Cal.), D.P.H. (Cal.),
Assistant to the Assistant Director of Public Health, Malaria Research, Bengal.

This paper has been written chiefly for the purpose of showing those who are interested in the malaria problem the importance of a mosquito survey before launching any scheme to reduce malaria in a locality. To improve the health of Madarihat a proposal was made by the local authority under concern to connect the borrow pits alongside the Bengal Dooars Railway line and drain into the nearest river. This proposal being referred to the Public Health Department for opinion, a malaria survey was conducted in the month of May 1929 by the junior writer under the guidance of the senior writer to find out the actual conditions regarding the breeding of anopheline mosquitoes which are responsible for malaria at Madarihat. The survey was undertaken in the month of May because hospital records showed that the malaria incidence begins to rise by about May at Madarihat and reaches its highest point in July or August. A thorough search was made over an area of about one square mile.

Madarihat is within the Jalpaiguri Dooars. It is a small place located at the terminus of the Bengal Dooars Railway. The open ground on which this colony is located has been the result of afforestation. It has a bazaar close to the railway station. The charitable dispensary, the police outpost and inspection bungalows, etc., are

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

all grouped around this *hāt*,* as will be evident from the sketch map. There are two bustees as well, one on the west and the other on the north of the bazaar. The population of the area is about 200 only, consisting of a mixed type of people, viz.—

(1) Paharis,
(2) Beharis,
(3) Marwaris,
(4) Chinamen,
(5) Bengalees, and
(6) Bilaspuris.

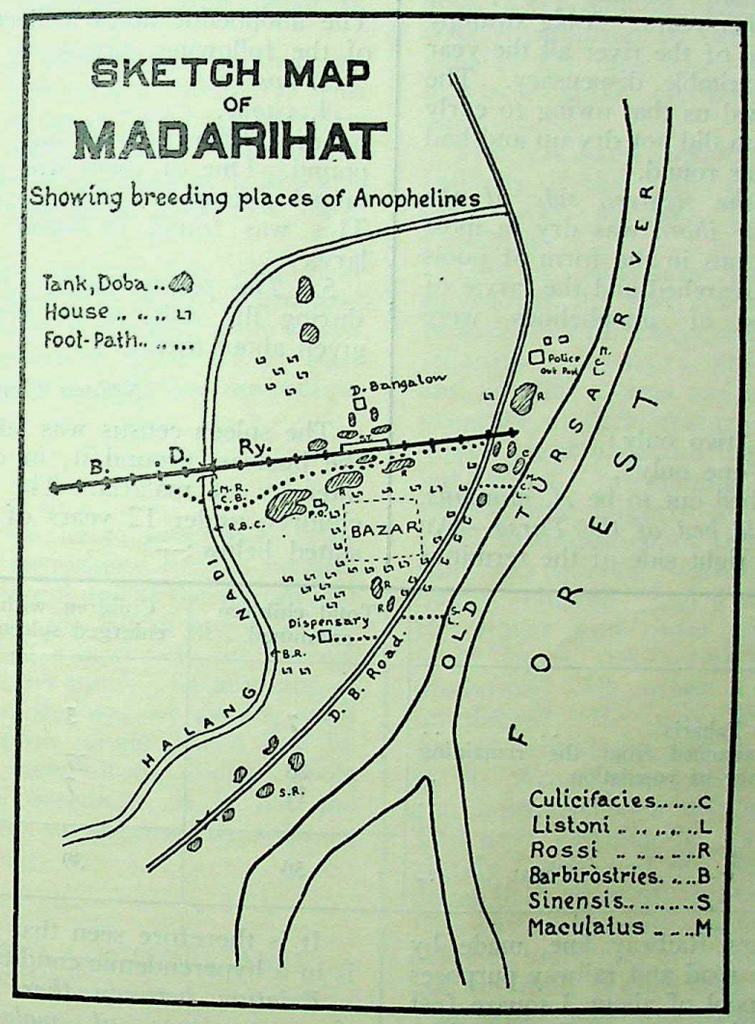
In the *hāt* most of the inhabitants live single for trade or business purposes; only a few live with their families.

forest extends from this stream right up to the present main stream of the Tursa, which is about two miles from this.

On the western side of the *hāt*, beyond the bustee mentioned before, a dry bed of a *jhora* was seen. This was fairly deep in some places and contained a certain amount of water, forming pools. The overgrown jungle on its sides was so thick that the bed was apt to escape notice.

There are open fields between this *jhora* and the bustee. Some of them lying on the west are under paddy cultivation, while others on the south are lying fallow.

On the north there are a number of borrow pits, and beyond them are situated the Bengal



The *hāt* is situated on the right bank of the abandoned bed of the Tursa river, which is overgrown with scrub jungle and *kush* grass. But, further to the north, close to the charitable dispensary, big trees are found with dense jungle underneath on the abandoned river bed. During our visit a fairly strong current was noticed in this old bed close to the police outpost, which was winding through the overgrown *kush* grass on its edge, but further south, the current gradually slowed down into a big swampy pool. Dense

Dooars Railway station and the railway embankment with a number of borrow pits on its side. close to the inspection bungalow.

The breeding places of mosquitoes may be grouped under the following headings:—

(1) The old bed of the Tursa.
(2) The stream on the western side of the *hāt*.
(3) Pools, either natural or artificially made by digging up stones for roads and railway purposes.
(4) Borrow pits—
(*i*) along the railway embankment,
(*ii*) along the District Board roads,

* *Hāt*, means market or bazaar; usually a bazaar held weekly.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*iii*) within the *hāt* compound.

(5) The paddy fields.

(1) *The old bed of the Tursa.*—After search along the edges of the stream on the abandoned bed of the Tursa and the natural pools in connection with the stream, the following species of anopheline larvæ were found:—

(*i*) *A. listoni,*
(*ii*) *A. culicifacies,*
(*iii*) *A. maculatus,*
(*iv*) *A. sinensis.*

From local enquiry it was ascertained that usually at this time of the year no water runs in the old bed of the Tursa near the police outpost, where the current was noticed to be fairly strong this year during our visit. Usually only pools, big or small, form in other years. A big swampy pool is found in the bed of the river all the year round opposite the charitable dispensary. The local inhabitants informed us that owing to early rains this year the stream did not dry up and had been running all the year round.

(2) *The jhora on the western side of the bazaar.*—The bed of the *jhora* was dry in most places but water collections in the form of pools hidden by jungle were searched and the larvæ of the following species of anophelines were found:—

(*i*) *A. rossi,*
(*ii*) *A. barbirostris,*
(*iii*) *A. culicifacies* (two only),
(*iv*) *A. maculatus* (one only),
(*v*) One pupa hatched out to be *A. minimus.*

(3) *Pools, in the old bed of the Tursa.*—An excavation just on the right side of the terminus of the Bengal Dooars Railway line, made by digging up stones for road and railway purposes formed into a small pool of about 3 square feet with sandy bed and clear water. On examination innumerable *A. culicifacies* were found in the larval and pupal stages, each dip showing some hundred specimens. Similar excavations are fairly numerous and some of them were being freshly made, just by the side of the District Board road and only a few yards off from the above-mentioned excavation. There were also pools formed of seepages.

(4) *The borrow pits.*—

(*i*) Those in connection with the railway line are mostly dry, except the two on the northern side of the railway station.

The anopheline larvæ from the dirty and foul water in them belonged to the species—

A. rossi,

A. vagus along with a large number of *Culex* larvæ.

(*ii*) There are a number of borrow pits on both sides of the District Board road and there were rain-water collections in most of them. The anopheline larvæ collected from them were of the following species:—

A. rossi,

A. vagus.

(*iii*) Other borrow pits, within the *hāt* compound. One of them was rather deep and contained a comparatively large amount of water. This was found to breed *Culex* and *A. rossi* larvæ.

5. *The paddy fields.*—They were quite dry during the visit, so no definite opinion can be given about them.

Spleen Census.

The spleen census was taken from the *hāt* and the bustees, around it, in order to find out the intensity of malaria. The number of available children under 12 years of age was only 56, as stated below:—

	Total children examined.	Children with enlarged spleen.	Spleen index.
1. *Hāt proper.*—			
(*a*) Among the Paharis	7	5	71%
(*b*) Children examined from the remaining mixed type of population	38	27	71%
2. *Bustee*	11	7	64%
TOTAL ..	56	39	70%

It is therefore seen that malaria in the locality is in a hyperendemic condition.

Relation between these breeding places and the prevalence of malaria at Madarihat.—The Madarihat charitable dispensary figures show that the incidence of malaria fever begins to rise in May and is at its height by about July and August, after which it begins to decline.

Malaria Incidence at Madarihat Charitable Dispensary.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924	72	81	182	172	245	257	300	315	225	213	255	297
1925	183	143	152	203	287	249	190	324	250	262	216	109
1926	118	134	151	179	342	324	395	316	201	159	252	252
1927	242	188	159	174	487	381	443	460	359	433	249	214
1928	245	229	265	300	442	342	372	267	251	152	119	172

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Hence the mosquitoes responsible for the new infections in the locality which occur in May must be in their larval stage of development at least some five or six weeks before this yearly rise. This fact becomes quite evident when it is kept in view that:—"When anyone develops an attack of malarial fever, for the first time in any season, it may be assumed (*i*) that he was bitten by an infected anopheles at least ten days or possibly a fortnight previously, (*ii*) that the infected anopheles that bit him lived as an adult insect for a period of at least 12 or 14 days, for the development of parasites in its stomach and salivary glands, and (*iii*) prior to that it had spent another 10 or 12 days in passing successively from egg to larval stage and eventually from pupal to adult form."

The place was visited in the month of May and most of the railway borrow pits were dry, with the exception of a few which had been breeding *A. rossi* and *A. vagus* only. Hence the source of mosquitoes responsible for the malaria at Madarihat must have been some place other than these borrow pits.

The actual findings showed that *the small stream in the abandoned bed* of the Tursa and *the pools either natural or artificially* made in the bed were the chief breeding places of at least three dangerous species of anopheline mosquitoes, viz.—

(*i*) *A. culicifacies,*
(*ii*) *A. listoni,*
(*iii*) *A. maculatus.*

Thus in the opinion of the authors these breeding places are mainly responsible for the malaria at Madarihat, and until and unless the stream and pools in the old bed of the Tursa are carefully dealt with, no amount of attention to the borrow pits only will help matters much. If anything is intended to be done in the way of dealing with the breeding places, scrub jungle should first be cleared to bring into view all the hidden pools where mosquitoes are breeding. It is not the intention of this article to suggest the solution of the problem.

PATHOLOGICAL LAUGHING AND CRYING.

By J. NORMAN PACHECO, M.R.C.S., L.R.C.P.,
Acting Medical Superintendent,
Ranchi European Mental Hospital.

In few textbooks on medicine is pathological laughing and crying described as a sequela of certain cerebral lesions, and the condition is so rarely met with that a description of the following case is not without interest. A European, aged 38, was admitted on the 4th February, 1929, with paresis of the left arm and leg. His previous history showed that he contracted syphilis in 1915, for which he was treated with a full course of mercury and salvarsan. In 1919 his Wassermann reaction was still positive and he had a further course of salvarsan. Up till 1927 he was quite fit and active. Since May 1927 he suffered from severe and continuous headache which ceased only at night and was accompanied by vomiting. The area of pain was just over the right eyebrow. Three days before admission he felt dizzy and reeled to the right side. Vertigo was constant and at the same time he noticed that his left eye grew weaker, and when reading he experienced a crescentic halo to his left. The day previous to his admission while typing letters he noticed that his left arm was cold, numb and weak. When he awoke the next morning he found his left arm and leg were paralysed. He was admitted soon after and on examination it was found that in addition to the arm and leg the left side of his face was paralysed. He could however smile on both sides equally on emotion.

The left hand lost its grip and all the deep reflexes of the arm were exaggerated, but there was no loss of tactile or postural sensibility.

The leg was less paralysed and could be raised off the bed for six inches. The deep reflexes were exaggerated. Babinski's sign (plantar extensor) was present, plus ankle and patellar clonus and no anæsthesia to pain, pressure or temperature.

The right arm and leg and sphincters were unaffected. Jaw clonus was present and the speech was slightly dysarthric.

On examination of the optic discs the right side was normal, but the left in addition to being "choked" had a small dark crescent in the lower and outer quadrant. The pupils were equal and active to light and accommodation. All other cranial nerves were unaffected. He was treated as a case of simple hemiplegia, and on 16th February, 1929, as his Wassermann reaction was positive, 0.45 gm. novarsenobillon was injected intravenously. The next morning he was found to be completely paralysed on both sides and had developed signs of acute bulbar paralysis. He was completely aphasic, had great difficulty in breathing and was unable to swallow, but no fluid regurgitated through the nose. The palate was also paralysed.

The plantar response was extensor on both sides. Throughout his illness the patient never had a rise of temperature.

The most marked feature of the case at this stage was the appearance of uncontrollable fits of laughter. He laughed heartily, incessantly, without cause, and without feeling any emotion whatever, and this in spite of the serious condition he realized he was in. Any stimulus, even the most serious topic, was sufficient to evoke peals of laughter which he could not control even when alone. His mental state was quite clear, and he experienced no pleasure or elation, but rather felt annoyed and expressed the opinion that it was

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

a positive nuisance. He cried on two occasions without cause and without experiencing any appropriate emotion. The next day (18-2-29) he regained some power in his left arm and left side of his face, and though there was considerable incoordination, he was able to raise his left hand and touch his nose. The power in both limbs gradually returned and in a fortnight he was able to use them, though weak, quite freely.

As he was still aphasic, he was only able to communicate by writing, which he did a good deal most of the day. The arms were the first to regain power. The legs followed gradually and then the face. A second injection of novarsenobillon was given and in a week's time he was able to pronounce a few labial consonants like P. B. M., but not linguals. Two days after the second novarsenobillon injection he complained of an uncontrollable impulse towards crying. He used to cry silently, and again without cause or any accompanying emotion. This however did not last long, and laughter reappeared. He was discharged on 20th February, 1929, by which time he had completely regained the power of his hands and was able to pronounce a few words and name common objects, though with a nasal twang, and could walk several steps but with some ataxia. He is now able to walk quite steadily and can talk a great deal but with a slight slurring and a nasal intonation. The laughter, however, still persists but is decidedly less noticeable.

Apart from its clinical interest the case affords an excellent proof of the fallacy of the James-Lange theory of the emotions, for here we have the exact opposite, i.e., vasomotor disturbance with the consciousness of the characteristic bodily changes, yet without experiencing the appropriate emotion. Numerous examples of this syndrome associated with pseudo-bulbar paralysis have been described by continental writers—the *Zwangslachen* and *Zwangsweinen* of German writers and the *rire et pleurer spasmodiques* of the French.

Kinner Wilson in an article in the *Journal of Neurology and Psychopathology* quotes a patient who "went off in a torrent of laughter on the slightest provocation or on none" and others who laughed on the receipt of grave news.

The question that is important in this problem is where is the lesion? According to Head and Holmes the thalamus is the seat of the emotions, but thalamic lesions are not always found at post-mortem in these cases, and, again, lesions of the thalamic and subthalamic regions do not always produce pathological laughing or crying. According to Brissaud the integrity of the thalamus is essential to life and the causative lesion is one involving the anterior limb of the internal capsule, where he places his *faisceau phychique* or fronto-thalamic tract of control over thalamic centres, but for pseudo-bulbar palsy he places the centres for involuntary expressions of the emotions in the basal ganglia. Several other authorities place the lesions in different areas but no precise information is given as to how these act. Kinner Wilson suggests that "lesions of the geniculate bundle anywhere in its course will impair volitional control over the musculatures concerned with expression of the emotions and as pseudo-bulbar paralysis is a disease of the geniculate bundles, lesions affecting it are particularly prone to be accompanied by the phenomenon of *rire et pleurer spasmodique*." He also lays stress on the fact that "corticifugal paths to the facio-respiratory centres in the pons and medulla are independent of the voluntary cortico-ponto-bulbar tracts to the same nuclei," that excitation will "modify the facio-respiratory synkinesis in the direction of either laughter or the reverse."

Now it is a well known fact that if a patient with a lesion, say of the right optic thalamus, is told a joke he smiles only on the right side, but when he assumes a smile both sides of the face act equally. But in a lesion of the right Rolandic area he smiles equally on both sides in response to a joke and an assumed smile occurs only on the right side, showing therefore that the motor element of emotion crosses to the opposite side. Now the only bundle which crosses from the mesencephalon to the opposite side is Monakow's rubro-spinal bundle. I suggest that this bundle subserves the function of the motor part of emotion that is involuntary. In addition there is a cortical portion of the system of motor neurons subserving the function of emotion connecting the cortex with the nucleus rubra. M. and Mme. Dejerine describe such a system, the fibres of which they state originate from all parts of the cortex, especially the parietal lobe. They skirt the thalamus just above the radiations of the internal geniculate body, enter into the formation of the tegmentum and reach the red nucleus at its antero-supero-external part, forming an upper segment of the emotional motor system.

I venture to suggest that the cause of pathological laughing and crying in cases of pseudo-bulbar palsy is to be found in the vicinity of the red nucleus, the lesion stimulating the rubro-spinal tract of Monakow, which may be considered the involuntary tract for emotion, and thus producing involuntary laughter or crying, and at the same time cutting off the cortico-rubral tract described by Dejerine, which tract may be considered to exercise a voluntary control over Monakow's rubro-spinal tract.

The result is that when the voluntary control of Dejerine's cortico-rubral fibres is cut off, stimulation of the lower rubro-spinal

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tract produces involuntary laughing and crying without the registration in the association areas of the affective tone of emotion.

CHAULMOOGRA OIL IN THE TREATMENT OF TRACHOMA.

By R. GUBBAY,
Superintendent, Zenana Hospital, Jammu, Kashmir.

Of the very large number of patients who attend our out-patient eye clinic, by far the majority are suffering from trachoma or granular lids.

I have tried many different remedies for this condition, expression, various operations, silver nitrate, and other drugs. Two years ago, however, I commenced to use chaulmoogra oil (obtained from Messrs. Smith, Stanistreet & Co., Calcutta), and the results have been so encouraging that I now use it almost to the exclusion of other applications. With the very first application there is immense relief, the lids feel lighter, the gritty sensation is less troublesome, the sticky discharge decreases, and vision is clearer.

Mode of Application.—A swab stick is soaked with the oil, and, the eyelids being everted, this is well rubbed into the surface, taking care to go as far back as possible into the fornix, at the same time protecting the cornea with the lower lid. The tears combining with the oil form a soapy substance. There is generally intense irritation for a few minutes and much watering of the eyes, but no more than occurs with copper sulphate or silver nitrate. This passes off very quickly, and I have never observed any injury to the cornea or conjunctiva, and have used the method successfully in hundreds of cases.

The application may be made daily, or—if this is found too irritant—every alternate day. About ten to fifteen applications suffice to clear up the condition; but I have given a longer series of applications with no cauterising effects. Scarring is much less with chaulmoogra oil than with other remedies. As to how the oil acts, I cannot say. Early cases react best to treatment, and in these three or four applications are enough to check the progress of the disease.

In acute cases after the first application there may be much swelling and œdema of the lids. This, however, is very rarely the case and does not occur if ordinary measures are used, such as hot fomentations, protargol drops, etc., until the acute symptoms subside.

One case treated was a child one year old. The lids were everted with huge granulations and could not be closed naturally. After four applications there was voluntary closure of the lids. The patient was brought to the hospital for a month, and thereafter was not seen again, so I conclude that there was no further trouble.

Chronic cases do very well indeed. In cases of affection of the margin of the lid with redness, the oil is rubbed well into the margin of the lids—about two or three applications are sufficient. I have treated babies a few weeks old with this remedy and the results are excellent, with no ill effects.

(*Note.*—We have shown the above article to the Superintendent of the Eye Infirmary, Medical College Hospital, Calcutta, who gives it as his opinion that the chief trouble about the treatment of trachoma and granular lids in India is the almost universal application of too irritant remedies, with bad results. Possibly chaulmoogra oil may represent a happy mean. The microbic cause of trachoma is almost certainly a filter-passing organism, and until something more is known about the ætiology of the disease than is at present the case, treatment is bound to remain empirical. Many of the acute cases are complicated by secondary infections, a Koch-Weeks' bacillus infection, gonorrhœal conjunctivitis, etc., and the treatment of these should not be neglected.—Ed., *I. M. G.*)

CHEMOTHERAPEUTIC INVESTIGATIONS WITH ANTIMONY PREPARATIONS IN THE EXPERIMENTAL KALA-AZAR OF THE HAMSTER.

By the late WILHELM ROEHL, M.D.,
*Elberfeld.**

The production of a general kala-azar infection in different laboratory animals, especially in dogs and mice, was a task which succeeded very rarely, until Smyly and Young (1924) discovered that in the Chinese hamster (*Cricetulus griseus*) infection occurred in practically 100 per cent. Thereafter M. Mayer (1926) showed that also in the European variety of the hamster (*Cricetus frumentarius*) a positive result could always be obtained.

The present writer examined the chemotherapeutic properties of different antimony compounds in infected hamsters. The leishmania strain used was obtained through the kindness of the Institut. f. Schiffs-u. Tropen-hygiene, Hamburg.

First of all the toxicity of each compound per kilo body-weight was ascertained. The injections were given subcutaneously. For treatment a single weekly injection was found to be the best possible method. The efficiency of the different compounds was estimated by puncturing the liver of the hamster once weekly and examining a smear for leishmania after staining with Giemsa's stain.

(* *Note by the translator:*—Dr. Wilhelm Roehl was an assistant of Professor Paul Ehrlich from 1907 to 1909 and took part in the investigations concerning the new preparations 606 and 904. From those days he devoted his life to chemotherapeutical research, the methods of which he had been taught by the originator himself. In 1911 he became Superintendent of the Chemotherapeutical Research Laboratory of Messrs. F. Bayer in Elberfeld. An important part in the history of the discovery of "Bayer 205" is due to his research and only lately he carried out all the numerous trials connected with the discovery of "Plasmoquine." The method of administering certain quantities of the chemical compound to a bird infected with *Plasmodium relictum* by means of the stomach tube is due to him. And only with this method it was possible to work out the exact chemotherapeutic effects of the different compounds of the Plasmoquine group.

His last work was connected with antimony research, but was not finished. He died suddenly of septicæmia, at only 48 years of age.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It was possible to keep the animals, which were under permanent microscopic control, free from parasites for several months if efficient compounds were employed, whereas control animals, which were left without treatment, always showed a heavy infection.

By this method the smallest effective doses were ascertained and comparative trials made possible. There were interesting differences as regards tolerability and efficiency among the compounds under examination.

Out of their number we will publish only the results of those which have already been tried clinically and which consequently may have special interest.

(1) *Tartar emetic* (36 *per cent. Sb III*).

The compound produced after hypodermic injection—the only one which could be taken into consideration in the hamster—severe superficial necrosis.

As tartar emetic was not suitable for therapeutic experiments, another well-tolerated trivalent antimony compound was employed:—

(2) *Antimosan* (12 *per cent. Sb III*).

Tolerated dose 1.0 gm. per kilo body-weight of hamster (or 0.125 Sb per kilo).

Smallest efficient dose 0.2 gm. per kilo (or 0.025 Sb per kilo).

Chemotherapeutic Index.—1 : 5.

The two following preparations are pentavalent compounds:—

(3) *Stibosan* (31 *per cent. Sb V*).

Tolerated dose, 0.7 gm. per kilo (or 0.21 gm. Sb per kilo).

Lethal dose, 1.0 gm. per kilo (or 0.31 gm. Sb per kilo).

Smallest constantly efficient dose, 0.15 gm. per kilo (or 0.046 gm. Sb per kilo).

Sometimes efficient dose, 0.1 gm. per kilo (or 0.03 gm. Sb per kilo).

Chemotherapeutic Index.—1 : 5 up to 1 : 7.

(4) *Neostibosan* (42 *per cent. Sb V*).

Tolerated dose, 1.0 gm. per kilo (or 0.42 gm. Sb per kilo).

Lethal dose, 2.0 gm. per kilo (or 0.84 gm. Sb per kilo).

Smallest efficient dose, 0.02 gm. per kilo (or 0.008 gm. Sb per kilo).

Chemotherapeutic Index.—1 : 50.

These experiments show that "Neostibosan," which was also found to be of very low toxicity in mice after hypodermic injection, differed from the other antimony preparations and had a very high therapeutic index in kala-azar.

The trials of antimony preparations in other experimental diseases like nagana or dourine of mice have not given any definite clues as to the value of various preparations as a kala-azar remedy (Uhlenhuth, Kuhn and Schmidt, 1925). Consequently these measures were of no use in the investigations with "Neostibosan" (Schmidt, 1928).

However, the results in experimental kala-azar of the hamster confirm the clinical findings of Napier (Napier and Mullick, 1928) who has tried "Neostibosan" in human kala-azar and who has ascertained that high efficiency of this preparation combined with the absence of the hitherto experienced antimony by-effects.

REFERENCES.

(1) Martin, Mayer (1926). Empfanglichkeit des europaischen Hamster (*Cricetus frumentarius*) fur Kala-azar. *Arch. f. Schiffs-und Trop. Hyg.*, Vol. 30, p. 347.

(2) Napier and Mullick (1928). The Intensive Treatment of Kala-azar by Neostibosan. *Indian Med. Gaz.*, Vol. 63, p. 445.

(3) Hans Schmidt (1928). The Pentavalent Antimony Compounds in Tropical Medicine. *Indian Med. Gaz.*, Vol. 63, p. 643.

(4) Smyly and Young (1924). *Proc. Soc. Exp. Biol. and Med.*, Vol. XXI, pp. 354 and 357.

(5) Uhlenhuth, Kuhn and Schmidt (1925). Chemotherapeutische Antimonstudien. *Arch. f. Schiffs-und Trop. Hyg.*, Vol. 29, p. 623.

A COAT EFFECT OBSERVED IN MICE WHEN FED WITH FATS UNDER CERTAIN CONDITIONS.

(A PRELIMINARY NOTE.)

By T. C. BOYD, F.R.C.S.I., D.P.H., F.I.C.,

LIEUTENANT-COLONEL, I.M.S.,

Chemical Examiner to Government, Bengal,

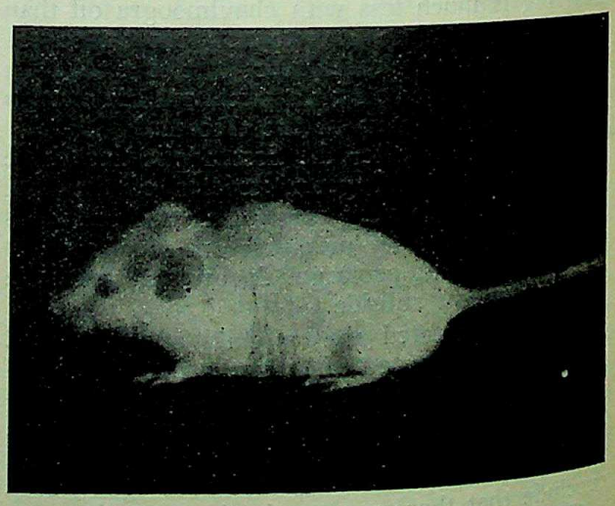
and

A. C. ROY, M.SC.,

Biochemical Research Worker under the Indian Research Fund Association.

WE have been experimenting for some time with various dietaries on monkeys on the following general lines:

(1) To produce an avitaminosis by the use of a polished rice diet.



No. 1.—Control.

(2) Feeding with samples of rice which had undergone various degrees of decomposition with the possible production of toxins.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

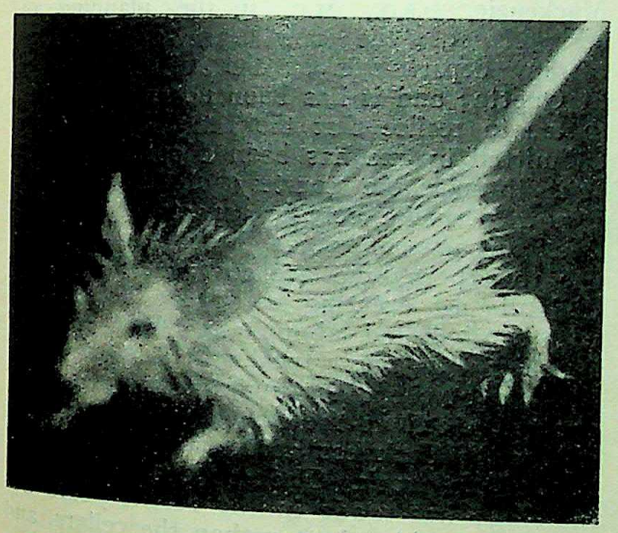
Digitized by Arya Samaj Foundation Chennai and eGangotri

During the course of these experiments we had at times occasions to add fat to the diet and for this we used a vegetable ghee. While the animals were receiving this diet we noticed a peculiar effect on their coats, the hair assuming a rough straight appearance almost as if the animal had been dipped in fat. To verify our observations we repeated the experiments on mice.

We first prepared a basal diet consisting of 100 grams of powdered polished rice, 20 grams of blood albumin, and 4 grams of common salt. A litter of young mice were taken and divided into three batches. To batch (1) was given the basal diet with the addition of 2 to 3 drops of cod liver oil and two or three grains of germinating gram; batch (2) were given the same, with the addition of 0.5 gram of vegetable ghee; and batch (3) with the same amount of pure cow's ghee.

After about six days on the above diets it was noticed that the mice receiving the vegetable ghee developed the peculiar appearance in their coats (this appearance may be well seen in the photograph).

The same peculiarity also developed in the batch to which cow's ghee had been added, while the control set remained normal. After about two weeks the diets were reversed, that is to say the



No. 2.—Fed on a diet containing ghee.

control batch were given vegetable ghee in their dietaries and the vegetable ghee batch were placed on the basal diet. In the course of a week the coats of the mice on the basal diet returned to normal, while the former controls developed the peculiarity in their coats. The experiment was repeated on several batches of mice, always with the same effect. We also tried the effects of the addition of olive oil and '*til*' oil and found that the same abnormality occurred, but the effect was not so pronounced.

We are not at present in a position to assign any reason for this phenomenon, but further work is in progress. In the meantime, however, we consider this peculiarity worthy of note.

NERVOUS MANIFESTATIONS IN TUBERCULOUS INFECTIONS.*

By Dr. P. V. GHARPURÉ, M.D. (Bom.),
Grant Medical College, Bombay.

In an address on tuberculosis and the nervous system by Sir Farquhar Buzzard, published in the *British Medical Journal* of 11th May, 1929, a number of conditions are referred to in connection with tuberculosis and the nervous system. In a subsequent number of the same journal, perhaps prompted by the publication of this address, some case reports have been published. I have with me case notes which I propose to embody in this note as I think they are of some interest.

The following cases are worth recording:—

Case No. 1.—A girl, aged 15, was seen by me in 1925 with a history that she gradually developed inability to attend to her school work and later developed inability to walk. When I first examined her she exhibited a slight squint and a dazed appearance. She did not show the same intelligence as before (I knew her since her birth). On examination it was noted that her speech was affected and it was of a monosyllabic character (scanning type). Her heart and lungs were normal. Her build and development were fairly good. Born of healthy parents, she was one of several children all of whom were quite fit. The examination of the nervous system showed vague signs. Her memory was not clear, so much so that she occasionally was unable to tell the name of the place she came from. She could not describe the onset and progress of her ailment; the deep reflexes were exaggerated; ankle-clonus was present on both sides, she used to get regular convulsive attacks starting from the face and spreading to the whole of the right side. There was some defect in vision. Thus at first sight the signs pointed to disseminated sclerosis. I advised that she be kept under observation and brought and kept in Bombay. Not clearly being able to make out what the matter was I consulted a prominent physician of Bombay who diagnosed the case as one of hysteria and prescribed a line of treatment including electrical treatment. I was not quite satisfied but continued the treatment in all its details and again submitted her to further examination by the same physician who still was of the same opinion. After keeping her under my care for one month I sent her back to her parents with no change in her condition. Later her doctor informed me that the girl developed typical symptoms of acute meningitis and died of hyperpyrexia fifteen days after she returned from Bombay. The total period of her illness was eight months. No cerebro-spinal fluid examination was done, no blood examination was done, and no post-mortem was possible.

One can speculate about the cause of the disease, but I was nearly sure that it was a case of tuberculosis. The exact nature of the lesion I was not sure of. I only kept the case before my mind for subsequent observations, thinking that the so-called "hysteria" might have been nervous symptoms of a latent tuberculosis.

Case No. 2.—Later, about the middle of 1925, a girl, aged about 13, was brought to me for regular twitching movements of the right hand and forearm. It was such a typical picture of chorea that I dealt with it at length and showed the patient to the students around me in the out-patient department as an ideal case of chorea. She was admitted to the hospital; on admission her temperature was 102°F. and she had a tendency to drowsiness.

I was somehow reminded of the former case and thought that this might be another manifestation of tuberculosis. I did a lumbar puncture, the fluid was clear, cells increased, mostly mononuclears, tubercle

* A paper read before the British Medical Association, Bombay Branch, on 19th July, 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

bacilli present. Seen the same evening, she showed definite signs of increased pressure in the meninges, Kernig's sign was marked on both sides, the temperature had gone up and I warned the relations that the case might end fatally. Next morning lumbar puncture was repeated and the same type of clear fluid under pressure came out. This puncture was done to relieve the pressure. The second afternoon, i.e., the third day after I saw her first, the temperature went to 106°F. and the girl died. Here again no post-mortem was available.

Case No. 3.—A girl, aged 14, was in a private hospital for some trouble with her ankle joint presumed to be of tuberculous origin. On examination there were no signs of tuberculosis. She was reported to be subject to hysterical fits. She was a child widow. With the experience of the former two cases in mind I was interested in this case and kept her under observation and attended her when she was in the fits. The fits were of an epileptic type and generalized throughout the whole of the body. She used to scream and had a marked aura in the form of twitching of the face muscles, upper extremities or lower. I watched a succession of fits one night. At first I told the father of the girl that she was a subject of hysteria, but later changed my opinion, being reminded of the former cases above referred to. Examination revealed that she had slight exaggeration of all deep reflexes and a faintly positive Kernig's sign. She was put under observation and her temperature was showing signs of rising. At this stage with 102°F. temperature a lumbar puncture was done. The fluid came out under pressure. It was clear, with cells increased, mostly mononuclears. Tubercle bacilli were found in it. After this examination I gave a grave prognosis and warned the house surgeon of the hospital and the parents that the commencing attack was probably the final stage in a tuberculous infection and that she might die of hyperpyrexia. Suitable treatment for hyperpyrexia was given. On the third day after the cerebro-spinal fluid was examined her temperature went up to 107.2°F. and she died. Here again a post-mortem was not available.

Case No. 4.—This case was that of a patient under Dr. Kohiyar's care at the J. J. Hospital. The patient was admitted with fever and signs of meningitis, and was for a couple of days only in the wards.

His temperature chart showed a persistent rise. The cerebro-spinal fluid showed lymphocytes and tubercle bacilli. After death a post-mortem was done. No tubercular lesions were seen anywhere. The subarachnoid space was tense with fluid, the fluid was collected and examined and it showed tubercle bacilli.

Case No. 5.—One more case may be cited of an adult male, aged about 32, brought down from Nasik by his relatives to Bombay. The history given by the relatives was that they considered him insane and a dangerous person and wanted me to certify him a lunatic. I examined him carefully. I noticed in him exaggerated knee-jerks and signs of meningitis and warned the relatives of a grave prognosis. The doctor who accompanied him was kind enough to give me details later. This man died of hyperpyrexia, developing signs of acute meningitis.

These are the cases I have come across which in my opinion may throw some light on nervous manifestations in tuberculous infection. The termination in all has been a typical acute tubercular meningitis, but I particularly wish to point out the initial signs and symptoms; the hysterical, the choreiform and epileptic manifestations. I am led to believe that the cerebro-spinal fluid is an unfavourable medium for tubercle bacilli, and this may explain the comparative absence of tuberculous lesions of the central nervous system and meninges even in cases which show generalized acute miliary dissemination. I have by now examined several cases in the post-mortem room.

Another suggestion I may venture to make. I believe that there are only some particular strains of tubercle bacilli which affect the central nervous system and an ordinary case of tuberculosis is quite free from nervous symptoms and has comparatively a very hopeful temperament. It may be that a particular strain gives off a neurotropic virus. It certainly would require experimental evidence to substantiate such a proposition.

On the other hand, to find tuberculous lesions in the central nervous system in very advanced and generalized tuberculosis cases in the post-mortem room is unknown so far as my experience goes.

X-RAY WORK IN BALUCHISTAN. (THE NEW X-RAY AND ELECTRO-THERAPY DEPARTMENT OF THE C. M. S. HOSPITAL, QUETTA.)

By J. H. BARRETT, D.M.R.E.,
CAPTAIN, I.M.S.,
Quetta.

One is not often fortunate enough to have either the opportunity or the funds to erect and equip a department designed solely for radiological and electrotherapeutic work. I have had the good fortune to be associated with Dr H. T. Holland, C.I.E., and Dr K. W. Mackenzie, D.S.O., M.C., in the planning and designing of the new *x*-ray and electrotherapy departments of the Mission Hospital, at Quetta; and it has been no small pleasure to me to realize that the actual building plan submitted by me has been adopted by them. It is through the courtesy of the above that I now describe certain aspects of the new *x*-ray department which I hope may be of use to others who are confronted with the difficulty of erecting a similar department with semi-skilled labour, and where economy is a *sine qua non*. Incidently it is no longer the fate of the unfortunate radiologist to be allotted a cell in the basement of a hospital where the darkness accentuates the difficulties of his work. The great advances that radiology has made in the recent years deserves something better than the cellars, and the Mission at Quetta has given a progressive lead in this direction.

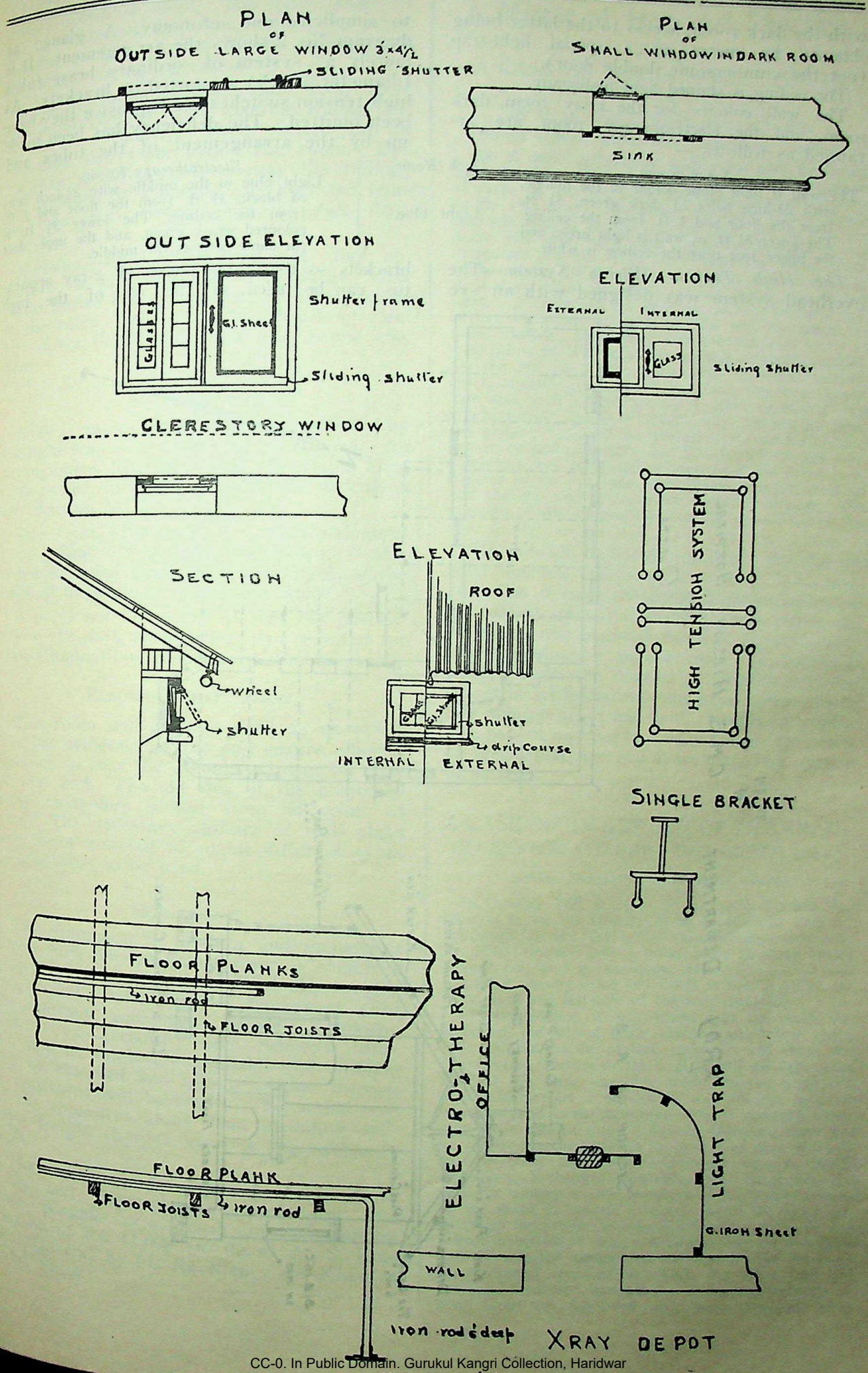
The Main X-ray Operating Room

The whole finished building is designed so as to occupy three sides of a square. Funds at present only allow two sides to be completed, one for *x*-ray work, and one for electrotherapy. The third side will be used, when constructed, for stores and ultra-violet rays, etc.

The main *x*-ray room (indeed the whole building) is built of kacha brick cemented over. Both ceiling and floors are constructed of wood. The dimensions of the room are as shown (see building plans). The back windows face north, and it communicates directly with the electrotherapy room and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

with the dark room, access to the latter being obtained by means of a special light-trap (not the cumbersome double door).

The ceiling is stained light mahogany.

The wall colours for the *x*-ray room, dark room, and the electrotherapy room are arranged as follows:—

X-ray Room.

The wall is light stone colour in the middle, with 2½-inch belts of dark green, 3½ ft. from the floor and 1 ft. from the ceiling. The lower 3½ ft. of wall is light green and the upper foot near the ceiling is white.

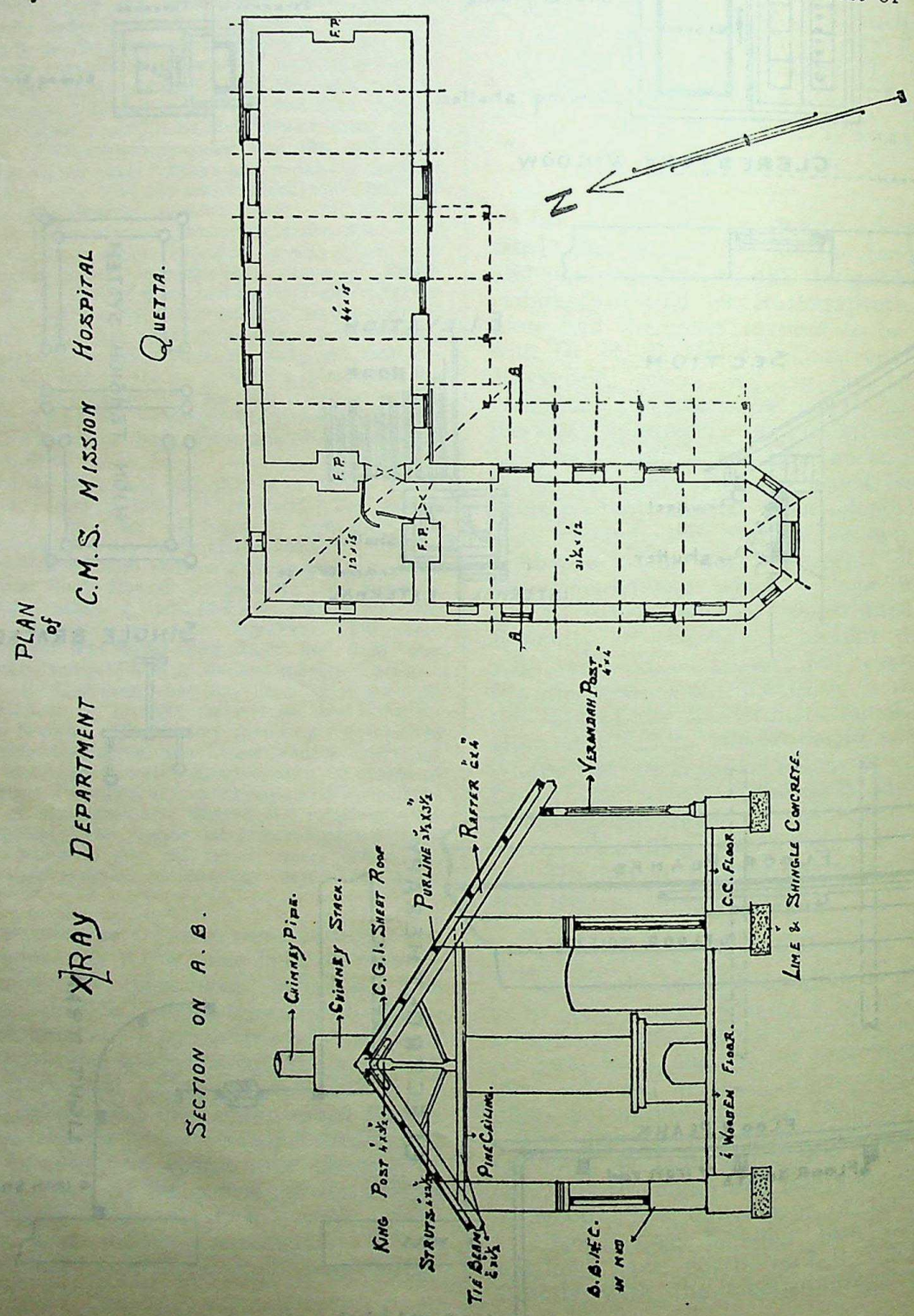
Dark Room.

Light blue.

Electrotherapy Room.

Light blue in the middle with 2½-inch belts of black, 3½ ft. from the floor and 1 ft. from the ceiling. The lower 3½ ft. is coloured grass green, and the upper foot the same blue as the middle.

The High Tension Wiring System.—The overhead system was designed with an eye to simplicity and economy. A glance at diagram No. 2 shows the arrangement. It is merely a system of ordinary brass tubes (diameter ½ inch) supported on brackets. As high tension switches are expensive they have been omitted. The deficiency has been made up by the arrangement of the tubes and brackets so that three pieces of *x*-ray apparatus can be used, so the cost of the high



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tension switch is saved. The special shape of the brackets, one limb longer than the other, enables correct spacing of the spring leads to obtain during operation.

Light Exclusion.—In the main *x*-ray room this is effected by using external sliding galvanized iron shutters. These shutters can be operated also from inside the room. The "roshan dans" (windows near the ceiling) are occluded by a special cap, operated from the room but opening outwards (see diagram No. 2).

Earthing.—Efficient earthing of the apparatus is facilitated by two large steel plates buried below the floor, one at each end of the room, and connected by a long steel bar down the centre, and also below the floor.

The Dark Room.

Easy access to the dark room is effected by the light trap door previously mentioned. An arrangement has been made to enable films to be passed easily in and out of the dark room (see diagram No. 2).

Safe Light.—By means of a simple arrangement films may be developed, using either screened daylight, electric light, or the light of an ordinary hurricane lamp.

A point not lost sight of was the possibility of the dark room being also required for transilluminations and for ophthalmic work.

Electrotherapy Room.

This room will also be used as an office. The bay windows at the end ensure efficient lighting so that the office work can be done at that end. The old idea of the combined *x*-ray room-office is bad from all points of view. The necessary number of wall plugs have been inserted to enable different types of apparatus to be used.

Equipment.

The equipment is modern and includes a Victor high tension transformer; a combined screening-stand and couch (Schall), metalix tubes, and Potter-Bucky diaphragm. The electrotherapy equipment includes a pleurostadt (Cox-Cavendish) and Schnee's baths. As soon as funds are available the building will be extended and also a further increase in apparatus will be made. The actual cost of the apparatus alone (not including delivery, freight charges, etc.) is approximately £750.

The erection and equipment of the above X-ray and Electrotherapy Department was made possible as a result of a munificent donation of Rs. 11,000 (to the C. M. S. Hospital, Quetta) by his Excellency the Khan of Kalat State.

A Mirror of Hospital Practice.

A CASE OF VARIOLA TREATED BY VACCINATION.

By C. D. CHATTERJI, B.SC., M.B., B.S.,
Medical Officer, Kapurthala Dispensary, Lucknow.

Mr. F. came to Lucknow with a son aged five years and a daughter aged eight years. The son got an attack of fever on the 16th May, 1929, and developed rashes on the 19th May. The rashes developed into a severe confluent type of variola and the child died on the 29th May. His sister aged eight years was brought to my dispensary on the 31st May, suffering from fever (temperature 104°F.). Her face was flushed but she showed no other symptoms, except slight pain in her joints. I diagnosed the case as one of smallpox and advised immediate vaccination. She was vaccinated the same evening. From that date the temperature never went below 104°F. and an ice cap was constantly applied. On the 3rd June (the fourth day following vaccination), pimples appeared on her face, forearms, hands, legs and feet which two days later developed into typical variola, but in a milder form. On the 6th June, the pimples appeared on the sites of vaccination and her fever came down to 102°F. Henceforth her convalescence was rapid and uninterrupted, the fever leaving her on the 7th June; the pustules quickly dried up and she was able to leave her bed after a week. The pustules of the vaccination took the usual time to dry up.

The point to be noted in this case was that the child was not previously vaccinated. This suggests that if cases of smallpox are vaccinated in the earliest stage, the attack becomes milder and the patient may be saved; however, the advisability of vaccinating a patient when the system is already under the reaction of an acute infection cannot be settled unless numerous experiments of this nature are made with favourable results. The patient may not be able to tolerate the effects of vaccination over and above the severe reaction of variola.

A CASE OF AN ABSCESS OF THE BRAIN.

By SURESH CHANDRA DAS GUPTA, L.M.S.,
Senior Surgeon, Bir Hospital, Nepal.

In October 1928, R. N. S., a male aged 20 years, was brought to the Bir Hospital in an unconscious state for depressed fracture of the skull caused 3 days previously by direct violence with a heavy piece of stone hurled against his head by an insane man. The patient was comatose, passing urine and stools in bed, and with the right hand and left side of the face paralysed.

On examination it was found that the scalp was lacerated, the wound being situated just below and a little anterior to the parietal eminence, and there was a compound fracture of the skull with much depression. But, as the pulse was very weak and the respiration almost stertorous, I decided to wait till the condition improved, and in the meantime ordered antiseptic dressings to be applied every 6 hours. However, there was no change for the better in the course of next 48 hours, on the other hand the temperature rose to 104°F. Therefore, I thought that delay was dangerous, and with the consent of the members of his family I made up my mind to operate at once. After the usual preparations the patient was anæsthetised lightly as he was almost insensible to pain, a semilunar incision was made and the infected margins of the wound were cut away after careful sterilization. Then the skull was laid bare and trephined, and all the in-driven fragments of bone from the depressed area were removed, when

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the membranes were seen to be torn, and as soon as they were separated there was a gush of pus from the brain. I then gently probed the cavity. It measured about an inch and a half in depth. Next, I had the cavity washed out with tepid sterilized saline solution and left a drainage tube in the cavity which was fixed to the scalp by means of two stitches, shown in Fig. 1. On the second day of operation the tempera-

Fig. 1.

ture came down, but the patient was still unconscious. I then administered urotropin. After a week of stupor he began to regain his senses and exhibited signs of feeling the pain at the time of depressing, and when he was asked to open his mouth or protrude his tongue he would do so. After the second week he regained consciousness completely, and though he could not utter a single word he could explain his motive by signs; he indicated that he wanted paper and pencil and actually wrote down the names of a variety of foods which he wanted. On the 17th day I removed the drainage tube, the cavity having been in the meanwhile nearly filled up. After three weeks I tried to teach him to utter words after me, but he could not succeed. I then asked him to imitate me by looking at my face and copying the movements of my mouth, and expressions. I explained to him the different sources of pronunciation of various letters, such as, lips, teeth, plate, and so on, and just like a baby he began to pick up new words daily.

After 4 weeks when the gap in the membrane was nearly filled up in order to cover the gap in the skull I had a thin silver plate made with 2 holes at either end for the purpose of suturing it to the scalp. Then in order to fix the plate and close the wound the patient was again put under chloroform, an incision was made on either side of the wound and the uneven margins were removed. Next, another incision was made 1½ inches away from and parallel to the former wound, and the flap between the cuts was raised by undermining the skin leaving the pericranium intact, and then the plate, having been sterilized, trimmed to fit the aperture and its edges smoothed, was applied on the base of the scalp-flap and fixed in position by silkworm gut stitches. The original gap was closed by bringing the edges of the primary wound in apposition over the silver plate by the bridge-flap method; by doing this a gap was produced on the outer aspect, above the ear, but this wound healed up very quickly.

Fig. 2 was taken 3 months after the patient's discharge from the hospital. The only defects he has now are

Fig. 2.

physical ones, such as slight weakness of the right forearm and hand, and slight incoherence of voice, but his mental condition is quite good.

A CASE OF ACCIDENTAL SUFFOCATION IN A WELL.

By J. F. HENRIQUES, L.M. & S., F.C.P.S., B.M.S.,
Medical Officer, Bulsar.

THE interesting letter from Dr. Rajandra Prasad on the above subject in the May number of the *Indian Medical Gazette* was found by me a very opportune one, as similar cases occurred in Bulsar.

On 16th June, 1929, in the afternoon I was sent for to render artificial respiration to 3 patients. The history was as follows:—A rice mill had a disused well in its compound, which for some reason or other was discarded and was being filled with husks which were also gathered in a large heap alongside the well. After some time it was decided, as the rains were setting in, to clean up the well and utilize the water for the mill machinery. The well was a deep one; the water was probably waist deep. A labourer went in but soon after shouted for help. It was thought that he had hurt himself. A second labourer went in to his rescue and did not return. A third then went in to the rescue of the other two, but also did not return. A fourth went in roped and immediately shouted to be drawn up, as he was feeling suffocated. The dragging out of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

three corpses was a difficult problem. A fifth man then went in, and very hurriedly and dexterously managed to strap one of the corpses to a hook which was at once drawn out; but he felt distressed in breathing for a short time and I had to get him into the fresh air away from the large crowd. He went in subsequently and brought out the other two corpses in the same way, though he felt distressed in the same manner each time. Artificial respiration was of no avail, as the bodies were in the well for nearly two hours. They were cyanosed. There was white froth coming from the mouth of one and food from another.

A lantern was then put in the well after the corpses had been dragged out. The light went out. Silver and brass ornaments were not tarnished.

According to Lyon's Jurisprudence carbon dioxide gas is produced by stored grain which has become damp; similar cases of dioxide gas poisoning are described in this book. I presume it was this gas which caused the tragic death of these three persons. It was germinated, in my opinion, from the husks.

A CASE OF RAT-BITE FEVER.

By M. A. KRISHNA IYER,

Medical Officer, Jammalamadugu, Cuddapah District.

A HEALTHY young man, aged about 26, a villager and a friend of the writer, was bitten by a bandicoot on his foot while returning from a hotel on a dark night in Madras. Some antiseptic dressings were applied to the wound and nothing was thought about it for some time. He is employed in a Government office and attended his office as usual. For about 6 months the ulcer did not heal. About October 1927 I happened to meet him at Madras. Then he showed me the ulcer in an unhealthy state with a good deal of inflammatory infilteration of the surrounding tissues. He told me how six months previously he had been bitten by a bandicoot and further added that he was getting irregular fever now and then, and that he felt very weak. I too noticed a change in his constitution. As I myself was ignorant of the characteristic symptoms that develop in a rat-bite case then, I could not help him much in the way of treatment. However, I asked him to have complete rest and proper treatment for the ulcer and to take some tonics for the general improvement of his health.

Soon after the publication of the article on rat-bite fever in the *Indian Medical Gazette* of September last, I got a note, that the condition of the patient was getting worse and that he had been reduced to a skeleton (a person who had appeared for police sub-inspector's selection for 2 or 3 years, and had had an excellent constitution with the necessary height, weight, girth, etc.), and that his disease had been diagnosed as, and was receiving treatment for, tuberculosis of the lungs.

On my suggesting to him the diagnosis of his condition, he approached his doctor with the object of getting injected with Neosalvarsan. For some reason or other the doctor did not give the injections and he had to go to another doctor, who gave him 2 or 3 injections.

He was cured and within the period of 3 to 4 months he regained his old constitution, and again appeared for police selection.

ASCARIASIS SIMULATING ABDOMINAL TUMOURS.

By J. F. HENRIQUES, L.M. & S., F.C.P.S., B.M.S.,

Medical Officer, Bulsar.

A HINDU, male child, age 5 years, had a number of masses easily felt within the abdomen. Duration of condition: 2 months. The child looked anæmic. A diagnosis of tumour had been made elsewhere, and the patient had been advised to come to the dispensary for operation. I felt about 4 or 5 masses on palpating the abdomen; one especially seemed unduly prominent and fairly superficial. It was felt above the right Poupart's ligament. I suspected malignancy and advised the patient that operation was out of the question, but as always happens when the doctor does not desire to do anything in a case the patient wants him to operate; in this case the child's father was very disappointed that I was not going to operate. As a *placebo*, I prescribed salol with mistura sodii compound and as the patient lived some miles away I gave medicine for four days. During this time the patient had 6 grains of salol. This drug has some slight anthelmintic action and four days after the child was again brought to the dispensary, having passed during this interval 25 worms. The lumps had all disappeared and the abdomen was flat. I then gave a santonin powder; the child only passed a few more worms.

Though the man, who belonged to the illiterate classes, was happy to see his child all right after taking my medicine and thought very highly of me, still I felt very insignificant to think how poor my diagnosis had been.

This case shows the importance of giving santonin as a preliminary measure to abdominal operations in tropical countries.

A RADICAL CURE FOR HYDROCELE BY QUININE INJECTION.

By B. L. SHARMA, L.M.P.,

Medical Officer, Chunar, District Mirzapur, U. P.

THE following method for the treatment of hydrocele has been tested by me and found successful in several cases during the last two years. During this period cases of hydrocele of different size and duration have been treated by me with this method, and in no case was there any re-accumulation of fluid.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The method is very simple, painless, without any bad after-effects, and takes only a few minutes to perform so that the patients can be sent home soon afterwards, and attend to their ordinary pursuits of life.

The Technic of the Operation.

Articles required:—

(1) An all-glass 10 c.c. syringe with a needle, 2½ inches long.

(2) An hydrocele trocar and cannula.

(3) Ten c.c. sterilized solution, containing 20 grains of quinine bi-hydrochloride and 1 grain of acid salicylic.

The scrotum is well cleaned and painted with tincture of iodine while the patient is sitting on a chair.

With all the necessary antiseptic measures the surgeon taps the hydrocele with the trocar and cannula, drains the fluid thoroughly, and leaves the cannula *in situ*.

The hypodermic syringe is filled with the quinine and acid solution, and emptied into the sac by inserting the needle into the cannula. (The solution should be slightly warm.)

The needle and the cannula are removed, the puncture wound rubbed well with the fingers, and painted with tincture of benzoin. The patient is then discharged with a suspensory bandage to be used for some days.

On account of slow absorption of the solution, the scrotum remains larger for about 15 days, but without any pain or inconvenience of any kind; it then becomes reduced to its normal size.

A PERSIAN TREATMENT FOR ORIENTAL SORE.

By SORAB BAPPJI VATCHAGHANDY, L.M. & S.,
82, *Nepean Sea Road, Malabar Hill, Bombay.*

In September 1928, a month and a half before I left Persia, where I was in charge of the Sir Ratan Tata Medical Hall, Yezd, a Zoroastrian boy of 6 or 7, was brought to me for some ordinary ailment. He also had a big oriental sore, a little larger than the size of a rupee, on his face, situated at the corner of the right ala nasi. His father, who accompanied him, had recently returned home with the boy from Teheran to visit his family. The boy had contracted the trouble in Teheran some four months previously. As they did not turn up next day I forgot all about this case. After three weeks the boy was again brought to me for cough, and to my surprise I saw the ulcer healed up, leaving a thin scar without much disfigurement. On inquiry I was informed that he had been taken to a fruit-seller in the bazar who had a specific ointment which cured this trouble in a week. Promising some monetary reward, with great difficulty, my friend, Arbab Shapoor Goostasp, a landlord and a merchant, persuaded the son of the fruit-seller, who also knew the remedy, to give me the prescription of this ointment. He brought me two powders. One was red oxide of mercury; the other "aishnoo." Aishnoo is the Persian name of a local plant which is dried, powdered, and extensively used, particularly in Yezd by the poor, as a substitute for soap for washing clothes. According to the man it is more important than the mercury salt. He told me "on the third day you will see that it brings out the roots of the disease from the ulcer." I weighed the powders he gave me, separately. The proportion was approximately one of red oxide and four of "aishnoo." In this proportion I used them for a case to be described below. The powders are triturated and a small quantity is mixed with the yolk of an egg, sufficient to make an ordinary paste, neither too thin nor too thick.

Oriental sore was not prevalent in Yezd at the time. I saw only two cases during my stay of 18 months. I am told that at times it is so very prevalent that even persons over 70 do not escape this infection. That it is common there can be easily verified by the number of patients attending the dispensary with scars, generally on the face. So, to verify the specificity of the ointment myself, with difficulty I obtained one case. The patient was a maidservant in a family. She was a girl of 13 and had contracted the sore some six months previously at her village, Allahabad, 8 to 10 miles from Yezd. The sore was situated on the extensor surface of the mid-forearm, was oval in shape, and nearly two inches in long diameter. I smeared vaseline on the healthy border, and applied the ointment on a piece of lint just the size of the ulcer. On application the burning was very severe, but it did not last long. Next day there was some pus, and, in spite of vaseline, the surrounding skin was a bit inflamed. I cleaned the ulcer with spirit and changed the dressing every day, applying freshly-prepared ointment. On the third or fourth day the ulcer, though rough, was clean, with a number of tiny white spots on its surface. These constituted "the roots" spoken of before. On being closely examined they resembled the heads of guinea worms protruding from a broken surface. When I tried to pull out one it would give way leaving a very thin white thread-like piece, about one-twentieth of an inch, on the forceps. After the sixth day I was nervous lest the ointment would be too strong for a healthy wound, but I went on with the dressings as usual, and on the tenth day the ulcer was completely healed.

(*Note.*—Ointments containing mercury, copper and arsenic are commonly used by the barbers in northern India in the treatment of oriental sore. Their action, so far as is known, is chiefly to cause irritation and inflammation with sloughing of the diseased tissue. There is no specific action. "Aishnoo" would appear to be some substance of the nature of soap-nut which contains large quantities of irritating saponins.—Editor, *Indian Medical Gazette.*)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail)

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones.

The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

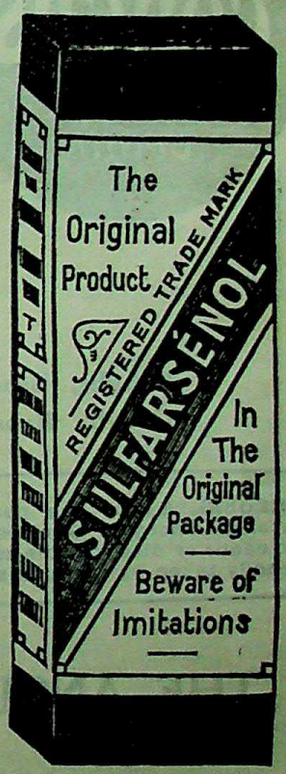
Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.



Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

OPOCRIN HEPAR.

Dose in Pernicious Anaemia 18 pills per day.

Special liver extract for Pernicious Anæmia, Antitoxic effects, to favour intracellular absorption of Glucose, and for diabetes when due to defective functioning of the liver.

Price, bottle of 50 pills Rs. 3.

For COUGHS whatever their origin

ONE GRAMME CREOSAL CONTAINS

Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

For COUGHS whatever their origin

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 480, BOMBAY
P. O. Box 226, MADRAS

Telegrams: "AMPSALVAS."

P. O. Box 7861, CALCUTTA.
P. O. Box 134, RANGOON.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

OCTOBER.

THE PARASITOLOGY OF INDIAN MALARIA: UNPUBLISHED INFORMATION.

In our issue for August 1929, we published an appeal for information with regard to the parasitology of Indian malaria. Previously to that we had circularised the different Directors of Public Health in the provinces of India, the Directors of major laboratories, and others whom we knew to be interested in the subject. The position briefly was that—with the exception of certain well-known papers of outstanding merit—but little has been published in the journals with regard to malaria in India during the present century, but we knew that exhaustive investigation and very many surveys had been carried out. The question at issue was, Where was all this mine of information buried?

The result of our appeal has been as amazing as it has been gratifying. We owe our deepest debt of all to Major J. A. Sinton, V.C., I.M.S., Director, Malaria Survey of India. Major Sinton recently spent two years in collecting and digging into the buried files in the various Public Health Departments, offices of the provincial Surgeons-General, and the major laboratories in India. The result was that in every province he was able to unearth stores of buried—and often forgotten—information, unavailable to the outside world. He proceeded to compile a *Bibliography of Malaria in India,* which is now in press, and which gives an exhaustive list of all these published and unpublished documents, chiefly from 1896 to 1926. This will shortly be issued as the first number of a new publication financed by the Indian Research Fund Association, entitled *Reports from the Malaria Survey of India.*

Major Sinton was kind enough to lend us an advance copy of the manuscript of his *Bibliography,* and, armed with this information, we wrote to various public health officials and others, asking for a loan of the various documents which we now knew to exist in their offices. The reply has been cordial and generous in the extreme.

The outside world may think that malaria has been but little studied in India since Sir Ronald Ross and the Italian workers made their famous discovery of the method of transmission of malaria. A study of the journals would certainly lead one to such a conclusion. But the true facts are entirely different. India contains within her borders almost every conceivable variety of climate in the world, and malaria has been studied in them all, with special reference to its parasitology and epidemiology. Of the wealth of information which has passed through our hands during the past three months, about 15 per cent. are papers published in well known and readily accessible journals, about another 15 per cent. have been published as local governments reports—some of which are very difficult to procure, and many out of print, and few or no copies available; the remaining 70 per cent. or so are still typed or hand-written documents. But the information which they contain covers India from north to south and east to west, and constitutes a mine of entirely untapped information already in existence with regard to the epidemiology of Indian malaria.

Let us take a few examples to show the true position of affairs:—

(*i*) Malaria in the North-West Frontier Province is dealt with in the journals chiefly in papers by Acton in 1910, and Adie in the same year; also in a paper by Sinton, dealing with Kohat. But there are many unpublished reports by Lieut.-Col. H. G. Stiles-Webb, I.M.S., when Sanitary Commissioner in that province, dealing with several areas; a series of annual reports on Peshawar city by Capt. Richmond, R.A.M.C.; and, above all, an invaluable report by Lieut.-Col. H. Stott, I.M.S., on a two years' survey of the Tochi valley, which gives a detailed account of the epidemiology of malaria in an almost rainless area in the North-West Frontier Province. Apparently Peshawar was relatively free from malaria until about twenty years ago, when an enterprising general decided that officers resident in the city should start gardens in their compounds and introduce irrigation. To-day Peshawar apparently shares with Dera Ismail Khan the notoriety of being the most malarious station in the province.

Col. Stott's paper is one of the most striking that we have seen. It is very fully mapped and illustrated with magnificent photographs of the type of scenery encountered on the frontier; it deals with malaria in barren outposts and rocky mountain areas. It is a document of intense interest, but at present it exists only in manuscript form.

(*ii*) The Punjab is fairly well dealt with in accessible publications. There is the classical memoir by Christophers on the terrible epidemic of 1908 and its aftermath, and there are several recent reports by Gill, as well as older ones by Adie. But there must be many unpublished documents. Still, taken as a whole, information about the Punjab is that most readily accessible and most generally known.

(*iii*) The United Provinces present a most interesting state of affairs. There is only one paper in the journals that we have been able to find; published in this journal by Phillips in 1924,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

recording the results of anti-malarial measures in five towns. He gives the following figures:—

		Spleen-rate.	Endemic (parasite) rate.
Lucknow,	1913 ..	2.2	7.4
	1923 ..	1.6	6.1
Nagina,	1909 ..	79.10	44.4
	1923 ..	13.49	6.0
Meerut,	1911 ..	5.9	6.0
	1923 ..	1.3	3.0
Saharanpur,	1909 ..	78.8	53.8
	1923 ..	7.3	10.3
Kosi,	1910 ..	81.3	26.0
	1923 ..	42.5	6.5

These are concrete results; they have been achieved on a minimum of expenditure wrung from the hands of unwilling District and Municipal Boards.

But the unpublished reports are innumerable; earlier work by Lieut.-Col. J. C. Robertson and Colonel J. D. Graham, I.M.S.; in recent years no end of survey work by Lieut.-Col. J. A. S. Phillips, I.M.S., recently Assistant Director of Public Health (Malariology), United Provinces. From Nepal to the Ganges, from extreme west to extreme east, and in the notorious Terai, malaria has been extensively studied, recommendations made, and precautions taken. Even the lake region of Bhim Tal and Sat Tal has been investigated. This is the most densely inhabited province in India, and here the problem has been fully tackled, but there is not a hint of this wealth of buried information in the journals.

(*iv*) Imperial Delhi is represented in the journals and Government of India publications, by Christophers' *Malaria in the Punjab* and in a recent report by Christophers, also published by the Imperial Government. The most important paper, however, is that by Hodgson which determined on Raisina as the most healthy and suitable site for the Imperial capital. Yet there is much other unpublished work, especially a recent survey by Senior-White, now, we understand, in press. Imperial Delhi indeed is not without a controversial aspect, for a member of the Legislative Assembly states that Delhi is (or shortly will be) an example to all-India and indeed to the Empire of a malaria-free enclave within a malaria-ridden country; whereas Mr. Senior-White's report shows that the European residents and their Indian servants suffer severely from the disease. There are hundreds of wells in the old city and its environs breeding *A. stephensi*, whilst the annual flooding of the Bela by the Jumna river leads to intensive breeding of *A. culicifacies*. The remedy which he suggests for the Bela is to remove the electric standards which cover it and to dust it with Paris green from an aeroplane. The latest *Annual Report of Health of the British Army* to hand states that Delhi is the third most malarious station in India.

(*v*) We had become accustomed to receiving enormous parcels of reports by post, but when we received the consignment for the Bombay Presidency, through the kindness of Dr. J. Munsiff, Director of Public Health, Bombay Presidency, we got rather a shock, for it was a packing case sent by rail.

The early local government publications by Hunter and by Bentley on Bombay city are well known, though copies are almost unavailable now. Marjoribanks in 1913 has a paper on malaria and mosquitoes in Salsette Island; Chalam has recorded his control work in connection with the Back Bay reclamation scheme in our columns; Powell in 1904 gave figures for two years' malaria in the Bombay police. Covell's 1928 survey was published by the Central Press, Bombay, but we have unfortunately not yet seen a copy. Yet there are very many additional unpublished returns—a report of a committee appointed by the Parsi Zoroastrian Association to enquire into the special prevalence of malaria among the Parsis; of another committee reported to investigate the prevalence of malaria among the nurses and patients of St. George's Hospital; reports of the general Bombay Anti-Malaria Committee.

Turning to the Presidency outside Bombay city, there is much information with regard to Sind and the Sukkur barrage, which we understand has been submitted for publication. There are several surveys of different areas, of Kathiawar by Major Sinton, of other areas by Dr. J. Munsiff, Dr. J. L. Pinto, Dr. J. Mello, and other Assistant Directors of Public Health (Malariology) all over the province.

The most important investigation of all, however, and the one which accounted for the packing case, is a survey of Kanara district by Dr. K. S. Mhaskar, lasting over three years. This is still in manuscript. It is a very fine piece of work. It begins with a thin fascicle containing the results of a preliminary and rapid survey. Then follow 12 big fascicles; these deal with the whole district village by village and hamlet by hamlet; everything is mapped, houses, breeding sites, nullahs, etc. Finally, there is a bulky final summary report, which is a model of what a report on the epidemiology of malaria should be. In contrast to what is observed in Burma, Dr. Mhaskar reports that the coastal plain is relatively healthy and malaria-free; the submontane tract is more malarious, but here the rivers descend in such spate that there is little chance for anopheline breeding; on the hill tops and the ghats malaria becomes intense, and is largely due to the inhabitants irrigating gardens and plantations by damming streams. This very fine summary report should be published; it is too important a piece of work in malariology to be buried.

(*vi*) Coorg is dealt with in the journals by Hassel Wright, and in McCombie Young and Baily's recent survey. The Andamans are dealt with in the *Government of India Scientific Memoirs* by Christophers, and in the *Indian Journal of Medical Research* by Covell and Baily, also in a government publication by Covell

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

separately. Ceylon is partly dealt with in the journals, but by far and away the most important report is a local government publication by Carter, published as a Ceylon sessional report in 1927. This shows the predominant position of *P. malariæ* as a cause of malaria in the mountain massif in the south of the island. It is the result of a two years' survey, village by village, and hamlet by hamlet, in a travelling motor laboratory. As an essay on malaria as studied in a tropical and densely forested island close to the equator it is of very great interest; an epidemiological study which certainly deserves wider publicity than it has yet obtained.

(*vii*) For Mysore State we have received much valuable information from Dr. W. C. Sweet of the Rockefeller Foundation, Health Consultant to the State. There is nothing in the journals for this area as far as we know. The only information for Hyderabad, Deccan, that we have been able to unearth is a series of papers by Surgeon-Major Lawrie in this journal in 1900; in that year he was diagnosing malaria species by examination of fresh blood, relying chiefly on the characters of the pigment observed; and he tabulates his findings down the left hand side of his paper, with corresponding freehand drawings on the right hand side beside each; clearly he was a little doubtful about the diagnosis. The Central Provinces is regrettably blank, though there is one paper by Kenrick in the journals, and Powell in Bombay quotes figures given by Buchanan for that area.

(*viii*) For the Madras Presidency there are first the very early work by Sir Ronald Ross himself at Sigur Ghat, and later numerous local government reports by Lieut.-Col. W. C. Ross, I.M.S., to which we have not had access. There is an early paper by James on Ennore, just north of Madras city, and Hodgson's survey of Madras city itself. Yet the Malaria Diagnosis Units, based on the King Institute of Preventive Medicine, Guindy, have carried out numerous surveys —chiefly under the direction of Dr. Menon—and their records cover the presidency fairly thoroughly, in all types of terrain, from the Western and Eastern Ghats to the flat seashore of the Bay of Bengal. The notorious Agency Tracts, north of Vizagapatam—probably *the* most intensely malarious area in the whole of India—are dealt with in Perry's reports in *Paludism* and the *Indian Journal of Medical Research*, and in a paper by Senior-White on malaria as a railway problem in this journal in February 1928. Here, again, however, we have been able to study much unpublished information. This area contains considerable quartan malaria among the indigenous hill tribes; but *P. falciparum* is the all-dominant species, and blackwater fever is very prevalent. (In Ceylon, where *P. malariæ is* almost predominant, blackwater fever is said not to exist.) The present importance of this area is very great, for, with the decision of the Government of India to make Vizagapatam a first class harbour, the Bengal Nagpur Railway are driving a line through from the Central Provinces across a country which consists chiefly of undulating plateau land densely forested, full of aboriginal tribes, and saturated with malaria.

(*ix*) For Bengal there are the early reports in 1900—1902 by Stephens and Christophers to the Royal Society. Calcutta city is dealt with in this journal by Lukis, Rogers, and Megaw. A report (original unaccessible) by Dr. Laura Hope is quoted by Sir Leonard Rogers in his *Fevers in the Tropics*, which goes to show that quartan malaria is predominant in Eastern Bengal. Our own experience in five years' malaria in out-patients in the Calcutta School of Tropical Medicine is entirely different; quartan malaria only constituted 7 per cent. of the total infections encountered. So amazed were we at this report that we had 100 films taken from dispensary patients with "fever" at Pabna, and studied them; the incidence of quartan malaria worked out at only 10 per cent. of the positive findings obtained.

For malaria in rural Bengal outside Calcutta city, there is but little accessible information; Bentley and Christophers' well-known report on blackwater fever in Bengal, and a paper by Armstrong dealing with malaria among Gurkha troops in the Teesta valley. But here we have to acknowledge the kindness of Dr. S. N. Sur, Assistant Director of Public Health (Malariology), Bengal, in placing at our disposal figures for almost every town in the province; also of Capt. B. S. Chalam, Malariologist, Eastern Bengal Railway, for full information with regard to that railway system. Dr. R. B. Khambata, officiating Director of Public Health, Bengal, has also kindly lent us a number of reports. In all we have details for 19 different towns and districts in Bengal. These all go to confirm the importance of *P. falciparum* (and not of *P. malariæ*) in Bengal.

(*x*) For Assam there is the early report by James on kala-azar and malaria in that province; reports by Shortt and by McCombie Young on malaria in Shillong; and Christophers' report on Nalbari in the journals. But Dr. R. Murphy has sent us his findings for two years in South Sylhet; Dr. G. C. Ramsay his for Cachar; whilst we are very much indebted to Major H. E. Shortt, I.M.S., for figures collected by the Kala-azar Commission in Golaghat and in Gauhati over some years. Lieut.-Col. J. Morison, I.M.S., from the Pasteur Institute, Assam, has also kindly sent us many unpublished manuscripts, and Assam can be mapped fairly thoroughly. These reports make it clear that, whilst *P. malariæ* contributes some 7 to 10 per cent. of the malaria in Assam, it is *P. falciparum* which is the predominant species. Quartan malaria is chiefly encountered among the hill tribes.

(*xi*) For Burma there are early papers by Fink and Lalor; also one by Stott, written in Mandalay, but of purely clinical interest, and containing no epidemiological or parasitological details. From a study of the journals one would

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

think that malaria had been scarcely studied at all in Burma.

The actual facts are entirely different. The epidemiology of malaria has been studied in Burma almost more exhaustively than in any other part of the world. In the first place there are a complete set of reports on surveys by Lieut.-Col. N. P. O'Gorman Lalor, I.M.S., and a later present-day series by Military Assistant Surgeon E. S. Feegrade, I.M.D., D.T.M. (Bengal), now Special Malaria Officer, Burma. These cover almost the entire country and afford a wealth of information. Lalor's reports are models of what reports on malaria surveys should be, yet they are all still in manuscript and unpublished. He has even investigated and reported on the ectoparasites of adult anopheline mosquitoes. Malaria in Burma, he writes, is hyperendemic in three different types of country: (*a*) the coastal littoral where salt swamps occur; (*b*) submontane areas densely clothed with forest and fed by perennial streams; and (*c*) areas in the beds of large rivers where swamps occur fed by perennial streams. There is only one factor common to all three areas—the presence of perennial streams leading to swampy conditions. In this series of unpublished reports lies a wealth of years of careful scientific investigation by a most reliable and careful worker.

The most malarious spot in Burma, he writes, is the island of Ramri, thirty miles from the Arakan coast, and the only safe harbour at all seasons of the year between Rangoon and Akyab. Until 1882 this island appears to have been healthy, then a local Oil Company imported extraneous coolie labour, and with it malaria. Government constructed a big embankment, which added to the local malarial incidence. By 1895 the town was recognised to be intensely malarious. In 1912, when investigated, the local spleen rate in children was 69.6 per cent. and the endemic (parasite) index 65.5 per cent. All three species of malaria parasite were prevalent, but at different seasons of the year. This unpublished report is one of the most interesting and detailed that we have as yet the pleasure of reading.

Even from the extreme north of Burma comes an unpublished report by Mr. E. S. Pinfold, a geologist in the employment of an Oil Company at Indaw in the Chindwin region, which shows that one need not be a medical man to study malaria. He gives a series of tables which show how the American oil drillers go down with attack after attack of malaria, and frequently die of blackwater fever; so severe is the disease in this sparsely inhabited country that the oil drillers have to be taken away from it during the rains. The chart for annual incidence of malaria is a most unusual one, for the heaviest incidence of malaria occurs *before* the rains, in April and May, and not after the rains. The report is accompanied by a very fine series of photographs showing the character of the country, broad rivers and densely forested hills, oil wells, mud volcanoes and the like—what one would take to be typical *A. maculatus* country. This report certainly deserves to be rescued from oblivion. And from northern Burma the story can be continued into French Indo-China where the French observers have studied malaria in every province in that country. Further, although the information is scanty, Faust's important paper for China gives the incidence of *P. falciparum* infection as heavy in the southern corner adjacent to Burma and Tonkin.

Now we understand that the Indian Railway Board has sanctioned the driving of the railway from Assam into Burma through the Hukong valley, and that operations on this project will shortly be commenced. From every report that we have seen it may be concluded that this almost unsurveyed tract of territory is intensely malarious, that *P. falciparum* infections predominate and that blackwater fever is extremely prevalent. We trust that the Railway Board will not lose sight of the grave importance of malaria in connection with this scheme.

(*xii*) From Burma also the survey may be continued into the Federated Malay States. There is Sir Malcolm Watson's book on the *Prevention of Malaria in the Federated Malay States*, and a few papers in the journals dealing with Kuala Lumpur. We know that extremely important work has now been carried out for many years on the control of malaria in Singapore, but we have been unable to find any report on this work in the journals available.* By way of contrast the tiny group of islands in the Riou archipelago, in the narrow strait between Singapore and Sumatra, is the subject of two important papers by Dutch workers.

* * * * *

We have attempted, briefly and cursorily, to summarise this amazing position. There are several deductions to be drawn from it. In the first place India owes a debt of gratitude to Major Sinton for his revelation of this mine of unpublished information in existence with regard to the epidemiology of malaria in India. It was a very laborious, but not a thankless task. Its results have been of the utmost importance.

In the second place, something ought to be done about these innumerable unpublished papers, for the outside world has no idea at all of the immense amount of study of malaria which is going on all over India. To give an example, the classical memoir by Christophers on malaria in Singhbhum district—a paper of the utmost importance to every student of malaria—was first published as a local government publication. Only later, when a demand for copies arose, was it republished in the *Indian Journal of Medical Research*, and made generally available to malaria workers all over the world.

* Since this was written, we have received full information and a most valuable report from Dr. P. S. Hunter, Municipal Health Officer, Singapore.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Several of the more important reports which we have referred to have been printed as local publications, and we would urge Directors of Public Health in the different provinces to send copies of these, if available, to the *Tropical Diseases' Bulletin* and the *Bulletin of Hygiene* as a first measure towards publicity. We understand that the Indian Research Fund Association is about to commence the publication of a series of special memoirs dealing with the epidemiology of malaria in India, and that Major Sinton's compilation of a complete bibliography of malaria in India is but the first step towards the "release" of many of these buried records for general information. We are delighted to receive this news. Some months ago we suggested that the congestion both in the *Indian Medical Gazette* and in the *Indian Journal of Medical Research* was now so acute that the former journal *Paludism* should be resurrected. The history of that journal may here be recalled. At the time when the late Sir Pardey Lukis was one of the most efficient and able Director-Generals that the medical services in India have ever had, all-India malaria congresses were held in successive years at Simla, Madras and Lucknow, provincial malaria committees were appointed, anti-malaria policy was defined, and *Paludism* was published as a journal to deal with anti-malaria work in India. Five consecutive numbers of *Paludism* were published in 1911-1912, and contained many abstracts of papers published by local governments, etc. Then in 1913 the Indian Research Fund Association was inaugurated by Sir Pardey Lukis; this Association commenced the publication of the *Indian Journal of Medical Research*, and *Paludism* lapsed.

The Malaria Commission of the League of Nations is at present touring India. (We have seen a part of the very strenuous programme which lies ahead of this Commission, and can only express the hope that the members of it will escape contracting malaria themselves, for they will study several intensely infected tracts of territory.) We believe that they will be amazed at the amount of anti-malarial work and organisation that is going on all over India; they will come to the conclusion that the malariologists of India are too shy; they work steadily and quietly, and give the world at large no idea of the extent or importance of their work; their light is effectually hidden in locally published or even unpublished reports. Yet the position is an extremely promising one. With the creation of the Malaria Survey of India, and the commencement of publication of a special series of memoirs on malaria in India, the outside world may gain some idea of the enormous amount of successful anti-malarial work which is being carried on in every province in India.

India has recently entertained a distinguished malariologist—Sir Malcolm Watson—as her guest. During the course of his brief cold weather tour in this country, he passed certain strictures on the anti-malarial work which is being carried on in India. Still later he has suggested in the public press in India and England that medical men in India should proceed to the Ross Institute near London to be trained in anti-malaria work. We believe that Sir Malcolm Watson is of necessity in entire ignorance of this immense mine of unpublished information (indeed we ourselves were ignorant with regard to it until Major Sinton came to our help.) Also, we confess that we cannot see how studying mosquitoes on Putney Heath is going to help the malaria workers in India to grapple with their problems. There is an admirably conducted class for malariologists in existence at Kurnal under the Malaria Survey of India, where malaria is studied in the field in India. It is nonsense to say that India is not grappling with her immense problem of malaria—the most important of all public health problems in this country; the truth probably is that there is more investigation of malaria going on in this country than in any other in the world, *when the funds available are considered;* whilst both the Indian Research Fund Association and the military authorities in India are fully alive to the importance of India's malaria problem.

On the other hand we are informed that Mr. Andy Gump, a philanthropist in the United States, has promised a reward of five million dollars for "the last mosquito." Unfortunately, we are afraid that his money is safe.

As far as the parasitology in these unpublished reports goes, we have abstracted such information as they contain with regard to the geographical and seasonal distribution of the three species of human *Plasmodium* in India, and hope to include this information, with due acknowledgments, in the forthcoming memoir. But there is a whole wealth of general epidemiological information in these reports which should be surveyed, edited, and published, for the information of malaria workers throughout the world in general. Italy has her *Rivista di Malariologia;* we trust that shortly India will have a corresponding malaria journal or series of memoirs.

In the meantime, the present note has been written, in the first place to thank the very numerous officials and medical men who have come to our assistance, in the second place to draw attention to the existing state of affairs.

R. K.

Medical News.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

(Division of Tropical Medicine and Hygiene.)
Examination Result. 86th Term. March—July, 1929.

Passed with Distinction:

S. Taneja—Winner of "Duncan" Medal.
Gammal, M. A. A. El.
Navasquez, S. J. De.
Lowther, A. H.
Scanlon, R. W.
Yenikomshian, H. A.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Passed:

Aich, J. C.	Jones, R. C.
Aitchison, W.	Kwei, H. W.
Allen, K. W.	Lawlor, M. K.
Arndt, G. H.	Lowe, G. H.
Atta-Ullah, Sh.	Mahon-Daly, F. O. W. A.
Baboo, S. M.	McLagan, F.
Battson, A. A.	MacNab, R. A.
Bernard, A. V.	McCarthy, D. D.
Bermingham, H.	Mitra, S. K.
Buntine, R. M.	Mottet, L. H.
Cassidy, F.	Murray, C. P.
Chadha, M. S.	O'Connor, H. M.
Clay, D. B.	Pinson, R. F.
Evans, W. G.	Simpson, T.
FitzGerald, G. H.	Smyth, J. T.
Fleming, A. McK.	Soodeen, C. E.
Fraser-Smith, A. E.	Stuart, R.
Goh, K. K.	Thapar, D. R.
Henderson, R. B.	Ullah, M. A.
Henry, G. H.	Unnithan, G. N.
Husini, M. El.	Vost, K. C.

THE EIGHTH INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILOLOGY.

This Congress is to be held at Copenhagen from August 5th to 9th, 1930. The following are the statutes which govern the Congress:—

(1) The VIII International Congress of Dermatology and Syphilology will be held on August 5th to 9th, 1930, in Copenhagen.

(2) Any member of the medical profession approved by the Committee of Organization may become a member of the Congress by registering with the Secretary-General before July 1st and by paying the fee for membership.

(3) The fee for membership shall be £2, $10 (U. S. A.), 240 francs, or 40 Reichsmarks and shall entitle the member to one copy of the report of the Congress. Relatives of the members shall pay half the ordinary fee. Membership certificates shall be delivered at the office of the Congress on presentation of the receipt for subscription fee.

Application for attending the Congress shall be addressed to the Secretary-General.

(4) Members are requested to use the English, French, German or Italian language.

(5) The programme of the Proceedings shall be determined by the Committee of Organization, printed before the opening of the Congress and distributed to the members together with their certificates of membership..

(6) The subjects for discussion shall be of two classes: those selected in advance by the Committee, and those announced by the individual members of the Congress.

Each subject selected by the Committee shall be opened by two "rapporteurs" and a number of "co-rapporteurs," invited by the Committee. The reports shall be printed and distributed before the opening of the Congress. Papers on other subjects shall be announced to the Secretary-General before April 1st. Such papers must not have been published nor read before any scientific society.

(7) Thirty minutes will be allowed to each "rapporteur," 15 minutes for each "co-rapporteur" and for each reader of voluntary papers. Five minutes will be granted to any member for discussion of papers. The members are urgently requested not to exceed these time limits.

(8) Microscopes and projectors will be provided for the use of members.

(9) The typewritten text of the papers must be left in the office of the Secretary-General before the end of each meeting.

(10) The Committee of Organization shall decide as to the complete or partial publication of papers in the report of the Congress. The papers shall not exceed a maximum of 16 pages of 3,600 letters each for the "rapporteurs," and 6 pages for the "co-rapporteurs" and voluntary papers.

The Report of the Congress shall be published in the French language, the scientific papers in the English, French, German or Italian language according to the desire of the authors.

(11) In connection with the Congress a scientific exhibition of casts, photos, drawings, anatomical and bacteriological preparations will be arranged, and also a technical exhibition of instruments, apparatus, medical preparations, etc.

The Secretary-General to the Congress is Dr. Svend Lombolt, Raadhuspladsen 45, Copenhagen, to whom applications for membership, for participation in the exhibition, and for permission to read papers should be addressed.

The special subjects selected for discussion in the 1930 Congress are: (*i*) the ætiology and pathogenesis of eczema; (*ii*) immunity, re-infection, and super-infection in syphilis; and (*iii*) tuberculosis of the skin and its treatment.

This international congress is now well recognised as a very important one, and there may be some of our readers who may be in a position to attend it, or to send in papers.

SPECIAL ARTICLE.

THE IMPORTANCE OF REFRACTOMETRY IN CLINICAL RESEARCH.

By Dr. PAUL ROSTOCK,

University Clinic, Jena.

At the present day physico-chemical problems govern more than ever the method of working and the speculation of the scientist, and it is therefore not surprising that the medical research worker has made himself fully conversant with this method, in order to employ it in the most varied fields of investigation. Thus the determination of the optical reaction of the different human secretions and excretions has given us a deeper insight into what goes on in the body under healthy and diseased conditions. The polarimeter, the spectrograph and recently, the interferometer also, are used for clinical purposes; besides these, the refractometer has also for many years been looked upon as part of the equipment of a well-furnished laboratory.

With the aid of the last-named instrument the refractive index (also called coefficient, exponent or quotient) of a substance is determined. It is universally known that the velocity of light transmission varies in different substances. Rays of light passing from one medium to another alter their direction according to the laws of refraction at an oblique angle of incidence. For biological investigations the combination air against liquid; or, in the case of examinations made by means of instruments, liquid against glass, comes almost exclusively into consideration. On this assumption we understand therefore by "the refraction of light of a liquid" the refraction suffered by a ray of light which passes from the air into the liquid. The physical laws obtaining for this case may be summarised as follows. Under identical external conditions (such as temperature, pressure, etc.), the ratio of the angle of incidence

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

h to the angle of refraction b is the same with the same media.

$$\frac{Sin\ h}{Sin\ B} = n$$

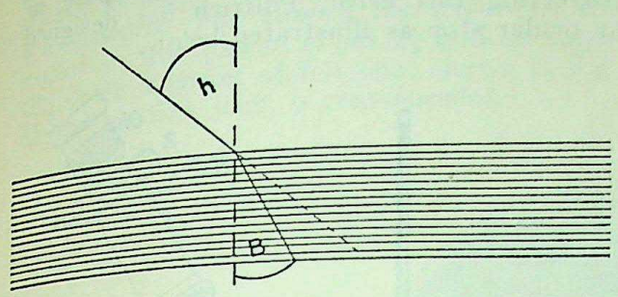


Fig. 1.

By n we understand the index of refraction already mentioned above. In this connection it is not necessary to consider the definition of "specific refraction" and "molecular refraction"; on the other hand, the refraction of mixtures must be dealt with in detail. Careful investigations have shown that the refraction of mixtures in solution can be calculated from the refraction of the separate ingredients according to their proportion, provided no chemical changes have taken place when mixing.

As the refractive index alters according to the temperature during the investigation, the simplest and best plan is always to make the observations at the same temperature. If this is not possible, however, it is necessary to make a temperature correction of the value which has been read off.

First of all, we must acquaint ourselves with the apparatus available for determining the refractive index, and how it is manipulated. Numerous models of refractometers for the most varied ranges of application are constructed by Messrs. Carl Zeiss, Jena, one of the leading manufacturers of this type of instrument. It is impossible to describe them all here, but mention may be made of the Abbé refractometer, an instrument of great service for medical purposes, which is constructed with heatable and non-heatable prisms.

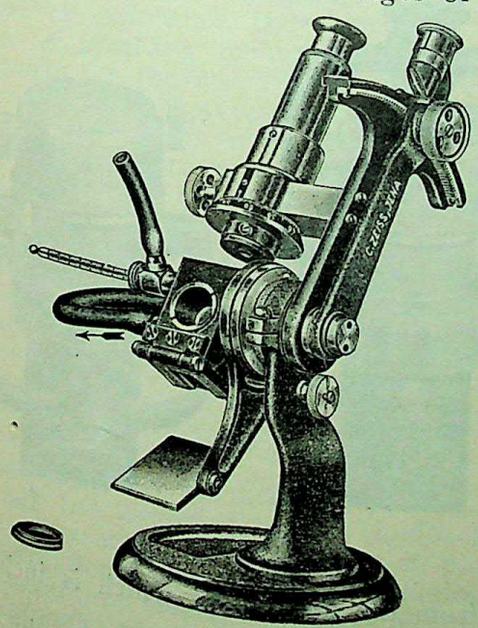


Fig. 2.

It is suitable for measuring the refractive index of all kinds of liquids and also of solid substances. For special examinations, especially in industry, the butter refractometer and the refractometer for the sugar and oil industries will be found of value; various models also serve for mineralogical investigations, amongst them being, in addition to complicated apparatus, a very compact and durable pocket refractometer for jewellers. Anyone desiring to be acquainted with the range of uses of this apparatus is referred to Loewe's excellent article (36) entitled "Refraktometer im Fabrikalaboratorium."

In addition to this apparatus, which is primarily intended for practical use in factories, reference must be made to Pulfrich's instrument, the finest and most ideal of refractometers.

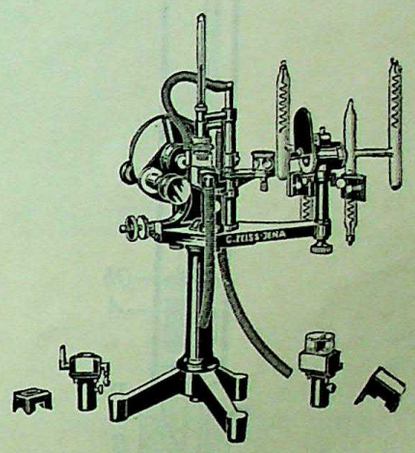


Fig. 3.

With this instrument all conceivable investigations can be carried out in the laboratory. These instruments are well suited to clinical research, but we have at our disposal an instrument which surpasses them considerably in simplicity of manipulation, without losing anything in regard to measuring accuracy for the purposes of the clinical physician. This instrument is the dipping refractometer made by Messrs. Carl Zeiss, Jena, of which some particulars follow as to its construction and manipulation.

It consists of a telescope-like instrument carrying on the one side an inclined prism and on the other an ocular.

The apparatus is extremely simple to manipulate. The prism is immersed in the liquid to be examined, which is contained in a glass beaker, and is illuminated from below by means of a mirror. A graduated scale is visible in the field of view. One half of this field of view is dark and the other bright,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the line of separation between the two being sharp. Should it have a fringe of colour, rotation of the knurled ring R (Fig. 5), which moves a compensator, will cause this to disappear. By means of the micrometer screw Z the scale can be so adjusted that a scale line coincides with the line of separation between bright and dark, and a value can then be read off on scale and micrometer screw, the index to the micrometer screw reading to tenths of an interval of the scale. The process of measurement is perfectly simple and unequivocal, and can be acquired in a very short time even by persons who previously were not familiar with optical measuring methods. With the aid of a set of tables, included with the apparatus and also reprinted on page 583 of this article, the true refractive index can then be easily calculated.

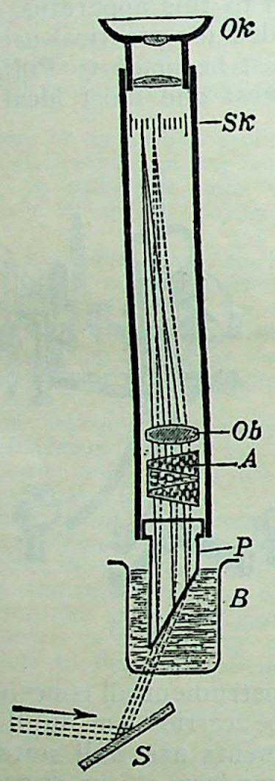


Fig. 4.

It frequently happens that the medical man has but very small quantities of liquid (for example, serum) available, and, when this is the case, the usual method of employing a small glass beaker and immersing the refractometer in the liquid would not do at all. However, in order that these small quantities may also be examined, a so-called auxiliary prism, suggested by Reiss, has been constructed.

The liquid (one drop is sufficient) is spread between the prism of the refractometer and the auxiliary prism, the latter being held firmly by a metal beaker with glass plate. The readings are taken as usual. The whole arrangement can be seen from the illustration (Fig. 5). If there is so little of the solution that the drop does not completely fill up the space between the two prisms, the line of separation in the eyepiece field of view does not appear sharp, and, for the purpose of correcting this error, Pulfrich has designed an ocular stop as illustrated below.

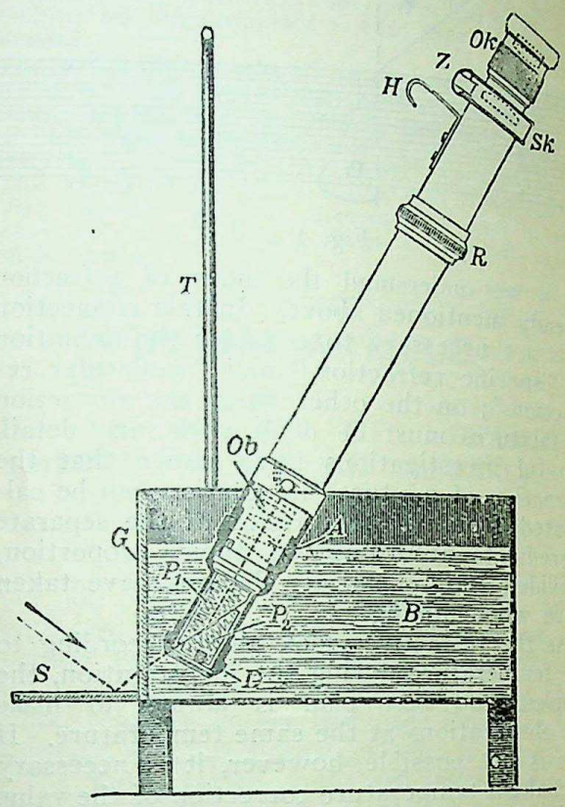


Fig. 5.

Its manner of attachment to the refractometer and also its application can easily be

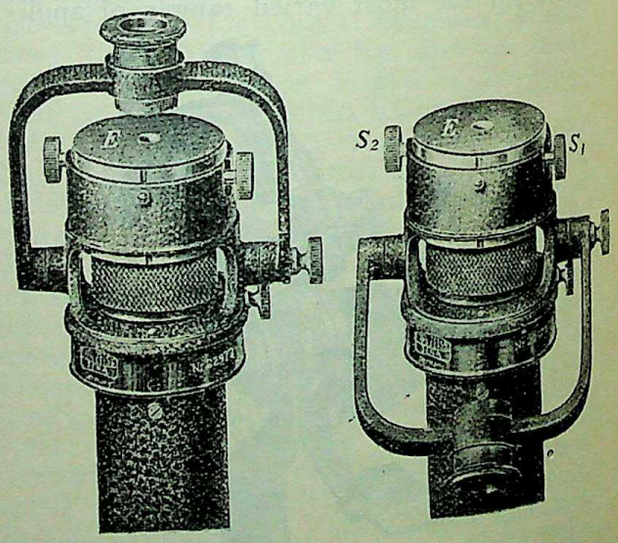


Fig. 6.

seen from the description which is included with the instrument.

A further important accessory to the dipping refractometer, which has not so far been commented upon, is the tempering bath. As

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

mentioned at the beginning, the refractive index of a solution changes with different temperatures, and it is therefore advisable always to make the investigations at the same temperature. For clinical investigations the use of an iron pan of about 2½ gallons capacity, with a jacket of felt (not shown in Fig. 7) and overflow joint, is recommended.

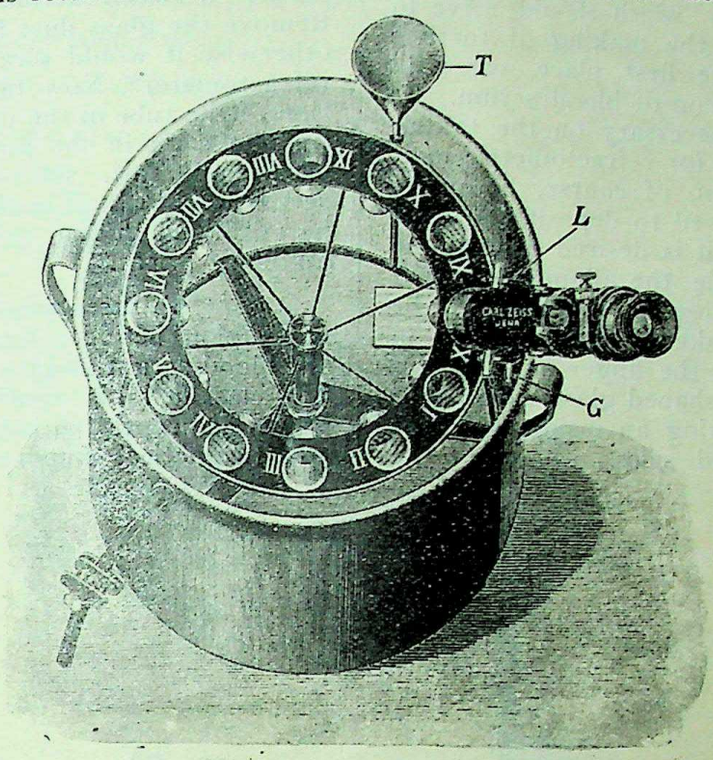


Fig. 7.

This vessel is filled with ordinary tap water which has been brought to a temperature of 17.5°C. Almost all biological tables are calculated for this temperature which, as shown by experience, is retained for a long time. A revolving umbrella frame with 12 apertures for the insertion of glass beakers is suspended in the vessel. One is thus in a position to make uninterrupted readings without having to wait until the temperature of the water and the freshly inserted glass beaker are the same, because by the time the 11 samples already in the bath have been examined the freshly inserted beaker with its contents will have acquired the temperature of the surrounding water.

Complicated thermo-regulators with heating spirals and water pressure regulators are, as a rule, not necessary for the medical man's investigations.

Finally, it may be mentioned that a flow-through cell, designed by W. Goldbach, has been constructed, which renders it possible, with rotational examination of samples of a like nature, to employ the principle of flowing-through which has been adopted with success in other directions, i.e., to displace the sample just measured by simply filling in the next, without any cleaning being necessary.

We will now turn our attention to the consideration of those fields of research in which refractometry has found favour, and which are of importance for both doctor and medical student. Here again only a brief sketch can be given; a detailed description, especially of the special technique, must be omitted.

Loewe's excellent account (37) gives a general survey of the results achieved by means of refractometry in the branches of technical chemistry, the chemistry of food, and also biology. The same author (36) has also given an account of the range of application of the refractometer in the factory laboratory. Again, Hirsch (22) has given a brief survey of the importance of the refractive index in physical chemistry. This is the subject which interests the medical man above all and the following details will give some idea of what has so far been achieved in this field. At the same time, it must be emphasized that my description in no way claims to be complete. The space at my disposal precludes this and an outline only can be given. I have, however, endeavoured to include in the list of literature all the works which are of importance for workers in particular fields of refractometrical research. The purpose of this list is to provide the means whereby the reader can refer to the original works for details of the technique and special results of investigation.

In 1913 Reiss (52) wrote a comprehensive account of the refractometric examination of blood and, since then, this method has found favour in all branches of pathology and physiology, so that at the present day no clinical

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

laboratory is complete without a refractometer.

It is quite impossible within the compass of this paper to touch even briefly upon all the knowledge that we have gained from refractometric investigations for our medical reasoning and actions: this would fill a voluminous monograph. The following merely constitutes a general survey which should serve to stimulate interest in the making of further investigations. In the first place, we will consider the examination of blood serum.

A few words are necessary on the taking of a sample of blood for refractometric examination. A vein can, of course, be punctured, the blood allowed to deposit and then be examined. But if it is desired to examine frequently, for example the albumen content of the serum, the following method will be found preferable. Make a small incision in the lobe of the ear or the finger tip and collect the blood in a U-shaped glass tube about 12 cm. in length, having an inside width of 2-3 mm. and distended sides.

In five minutes' time centrifuge the little tube sharply. If a centrifuge is not available the blood can be allowed to coagulate; when this is done, however, the yield of serum is less.

For the purpose of investigation, both sides are lightly scratched with a glass file on the border between serum and clot of blood. Remove the glass dust by wiping the tube, as otherwise it would scratch the prisms of the refractometer. Now take the U-shaped portion of the tube in the fingers of one hand and the two sides in the fingers of the other and break off both sides simultaneously. The serum is contained in these, and it can easily be examined in the refractometer with the auxiliary prism.

Reiss (52) has studied very exhaustively the connection between the refractive index of the blood-serum and its albumen content. He has classified his results in a set of tables, which are reprinted here, as they are of very great practical importance. In addition to

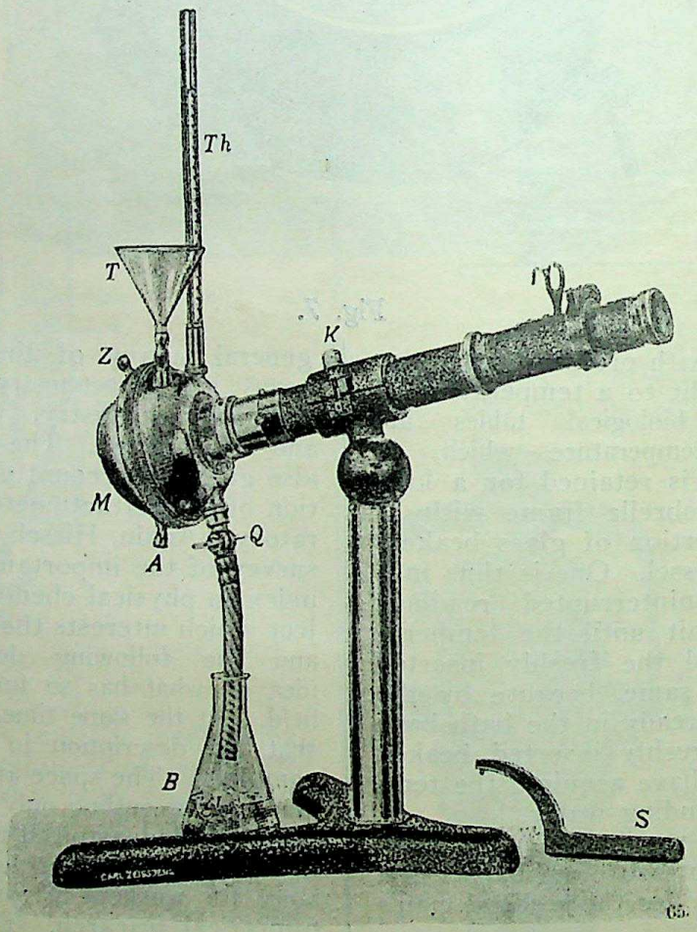


Fig. 8.

By capillary suction the little tube is filled with blood, the rapidity of the suction being regulated by sharply inclining the tube if necessary.

When one side of the tube is filled with blood, place the tube upright, so that the blood is uniformly distributed in both sides.

showing the percentage of albumen in the blood-serum, they include the percentage in transudation and exudation products, and, moreover, also render it possible immediately to convert the scale readings of the dipping refractometer into absolute refractive indices.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Reiss's Table for Converting the Readings of the Dipping Refractometer at 17.5°C. into Percentages of Albumen.

This table is in frequent demand in clinical laboratories, but as it is not readily accessible,* we produce it here with the author's kind permission in a somewhat expanded form.

Refractive Indices corresponding to scale divisions in same row.	Blood Serum.			Products of Examination and Transudation.	
	nD for distilled water .. .. 1.33320 *nD* for non-albuminous bodies .. .. 0.00277 Δ*nD* for 1 per cent. albumen 0.00172			*nD* for distilled water .. 1.33320 *nD* for non-albuminous bodies .. .. 0.00234 *nD* for 1 per cent. albumen 0.00184	
	Scale Reading.	Percentages of albumen.		Scale Reading.	Percentages of albumen.
1.33705	25	0.63		25	0.77
1.33743	26	0.86		26	0.97
1.33781	27	1.08		27	1.18
1.33820	28	1.30	Int. Diff. 20	28	1.38
1.33858	29	1.52		29	1.59
1.33896	30	1.74	0.1 Sc. div. / %	30	1.80
1.33934	31	1.96	1 / 0.02	31	2.01
1.33972	32	2.18	2 / 0.04	32	2.21
1.34010	33	2.40	3 / 0.06	33	2.42
1.34048	34	2.62	4 / 0.08	34	2.62
1.34086	35	2.84	5 / 0.10	35	2.83
1.34124	36	3.06	6 / 0.12	36	3.04
1.34162	37	3.28	7 / 0.14	37	3.24
1.34199	38	3.50	8 / 0.16	38	3.45
1.34237	39	3.72	9 / 0.18	39	3.65
1.34275	40	3.94		40	3.86
1.34313	41	4.16	Int. Diff. 21.	41	4.07
1.34350	42	4.38		42	4.27
1.34388	43	4.60	0.1 Sc. div. / %	43	4.48
1.34426	44	4.81	1 / 0.02	44	4.68
1.34463	45	5.03	2 / 0.04	45	4.89
1.34500	46	5.25	3 / 0.06	46	5.10
1.34537	47	5.47	4 / 0.08	47	5.30
1.34575	48	5.68	5 / 0.11	48	5.50
1.34612	49	5.90	6 / 0.13	49	5.70
1.34650	50	6.12	7 / 0.15	50	5.90
1.34687	51	6.34	8 / 0.17	51	6.11
1.34724	52	6.55	9 / 0.19	52	6.31
1.34761	53	6.77		53	6.51
1.34798	54	6.98		54	6.71
1.34836	55	7.20	Int. Diff. 22.	55	6.91
1.34873	56	7.42		56	7.12
1.34910	57	7.63	0.1 Sc. div. / %	57	7.32
1.34947	58	7.85	1 / 0.02	58	7.52
1.34984	59	8.06	2 / 0.04	59	7.72
1.35021	60	8.28	3 / 0.07	60	7.92
1.35058	61	8.49	4 / 0.09	61	8.12
1.35095	62	8.71	5 / 0.11	62	8.32
1.35132	63	8.92	6 / 0.13	63	8.52
1.35169	64	9.14	7 / 0.15	64	8.72
1.35205	65	9.35	8 / 0.18	65	8.92
1.35242	66	9.57	9 / 0.20	66	9.12
1.35279	67	9.78		67	9.32
1.35316	68	9.99		68	9.52
1.35352	69	10.20		69	9.72
1.35388	70	10.41		70	9.91

Example: Let the resulting reading be 43.6 sc. divs.

43 sc. div. correspond to 4.60 p. c.
44 „ „ „ „ 4.81 „
1 „ „ „ „ 0.21 „

Hence under Int. Diff. 21.
since 43 sc. div. = 4.60 p. c.
0.6 „ „ = 0.13 „
43.6 „ „ = 4.73 „

*Verh d. 76. Vers. deutscher Naturf. u. Arzte, Breslau 1904, p. 36 ("Klinische Eiweibbestimmungen mit dem Refraktometer") and Chapter on "Refraktometrische Mebmethoden in der Biologie" by E. Reiss, in Abderhaldens "Biochem, Arbeitsmethoden," Vol. 8, pp. 84, et seq.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

From them can be determined quite simply the percentage of albumen that corresponds to a refractive index reading on the dipping refractometer. It will be understood that the tables are only correct if it is assumed that the percentage of salts, etc., in the serum are practically constant, an assumption which entirely holds good in very many conditions of disease. The following table gives an idea of the disturbances which may be due to quantitative changes of the non-albuminoids in the serum. It gives the refraction of 1 per cent. substance in aqueous solutions calculated for the dipping refractometer:—

Sodium chloride ..	0.00175
Potassium chloride ..	0.00134
Disodium phosphate ..	0.0007
Urea	0.00145
Grape sugar ..	0.00142

Therefore, in conditions of disease which lead to a great increase of non-albuminoids in the blood (i.e., uræmia, diabetes, jaundice, etc.), the refractometric method of determining albumen is not to be employed, or else only by using a special method of correction.

Leendertz (33) has investigated the influence on refraction of the different kinds of coagulation. The relationship between refraction and viscosity of the serum has been studied by Rohrer (55), and, in carrying out his tests, he has verified the figures of Reiss (52). Herlitzka (21) has made very extensive investigations of the refractive index of protein solutions and recorded his results in numerous tables, to which reference only can be made here.

I must refrain from going into details as to the conclusions to be drawn by the doctor from the changing albumen content in the blood serum. In this connection the reader is referred to Reiss's comprehensive work (52), although it must be emphasized that since it was finished a large number of papers dealing with this branch of research have been published. Merely a few results of special interest may be mentioned briefly.

Pueddu (48) found the refractive index of the serum the same in healthy people of both sexes, young and old; menstruation, however, altered it. Normally, it lies between 1,348 and 1,351. Bergmann (7) states that the albumen content of the serum continually decreases in the second half of the period of pregnancy, more especially in the case of hydropic pregnant women, the decrease being as much as 10 per cent. In the case of protracted confinements, an increase of albumen in the plasma is observed. Masing and Denecke (39) ascertained by refractometric investigations that the serum from an anæmic region is about 6.5 per cent. thinner than that from capillaries, and the serum from clogged veins about 24 per cent. thicker. The values are constant in healthy persons.

Gansslen (16 and 17) has made very detailed investigations concerning the metabolism of minerals and other substances, in which he compared the refractive index of blood serum with that of the fluid of the tissues. This fluid he obtained by producing a "skin blister" by various artificial means, and his very interesting experiments merit extensive consideration. By means of refractometric investigations Zimmer (76) found that, when giving arsenical medication to human beings, there is to some extent a genuine deposit of substance; there is also, however, a spurious deposit owing to the retention of water in the blood and tissues. The condition of equilibrium between blood and tissue is very unstable. The influence of differences in nutrition on the albumen content of serum has been investigated by Mark (38) and recorded in several sets of curves. Different nutritive substances influence the albumen content very considerably; meat causes an increase in the absolute and relative quantity of albumen, and fat a decrease, whereas the administration of carbohydrates produces no change.

Meyer and Brühl (8 and 41) ascertained that, in the case of epileptics, the values taken during an attack differed from those taken at times when they were free from attack. In experimenting with serum in an anaphylactic condition in a rabbit Abderhalden and Wertheimer (2) ascertained a change in the refractive power when using the refractometer, whereas the rotary power, examined polarimetrically, was not altered. Roffo (54) found that by mixing the serum of cancer patients with that of horses the refractometric index is lowered and, by mixing horse serum with the serum of other patients, it becomes higher. It is important to observe that the index of horse serum does not differ very much from that of the serum of human beings. This proces should have a diagnostic value. Considering the practical importance of the findings it is extremely desirable that these results be further investigated. From the results of refractometrical tests on serum-albumen, Wiechmann and Horsters (75) have been able to draw important conclusions in regard to the progress of experimental recurrent infection of rats.

From the Düsseldorf Surgical Clinic Achelis (3) reports that refractometric investigation of the blood serum gives important indications for the duration and extension of an intended surgical operation and for the extension of the narcosis.

Basilico (4 and 5) investigated the fluctuation of the refractometric value of serum under different experimental conditions. With the acidosis produced by the injection of sodium butyrate or sodium isobutyrate, the hydræmia that ensues continues for several hours. The same condition is observed after the administration of a ten days' scurvy

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

diet. Burger (9) investigated the behaviour of albumen in the serum before and after operations, thus enabling an opinion to be formed as to the capacity of regeneration or the capacity of resistance of the organism. After the extirpation of carcinoma it was noticed that those cases quickly relapsed, in which, after the 6th day, the albumen values of the serum continued to fall. By means of other investigations he ascertained that the post-operative decrease of the serum-albumen is not simply the result of a thinning of blood due to loss of blood, but must be interpreted as an expression of the regenerative power. Szenes (64) has given particulars of refractometric investigations of the serum in myositis ossificans and struma.

The following employment of refractometry in connection with the serum is also interesting. To establish death from drowning, Szulislawska and Tobiczyk (65) compared in experiments the water-content of the body with that of the blood of the lungs, by investigating the contents of both ventricles of the heart with simultaneous determination of the freezing point; they obtained remarkable results. This method, however, failed in the case of decomposed corpses in water.

The methods employed for determining the combining-ratio of albumen and globulin in blood serum are interesting from the point of view of practice in clinical investigations and also when considered both theoretically and technically. Rohrer's method (55 to 57) is founded upon the determination of two physical values: refraction and viscosity. Wanner (73) has criticised this method and expressed doubt as to its reliability. Robertson (53) is the originator of another experimental method. In a serum test the following points are determined: (1) The refractive value of the non-albuminoids by heat coagulation, after acidification and separation of the coagulated albumen. (2) The refraction of the serum-albumin by combining the serum with a solution of sulphate of ammonia. (3) The refraction of the full serum. From these values is then calculated the percentage of globulin. Although this method of investigation is somewhat involved, values are nevertheless obtained which are extremely useful for practice. A micro method founded on the same principle has been devised by Berger and Petschacher (6), and the reader is referred to the original publication for an exact description of it. Schretter (71 and 72) has undertaken exhaustive experiments in connection with the specific refractive increase of serum-albumen, also serum-globulin, and his figures are important for the refractometric determination of these components in serum. The sources of error are fully taken into account in these investigations. Achelis (3) was able to obtain valuable hints for the indication and prognosis of surgical diseases by refractometric determination of the proportion of albumin to globulin. From the serum of persons suffering from tuberculosis Gänsslen and Maier (18) ascertained that, in advancing stages of the disease, the refractive value of the serum decreased considerably as the disease grew worse, and, hand in hand with the progressive process in the lungs, there is an increase of the globulin. It follows, therefore, that a regular refractometric control of the blood-serum gives important indications in prognosis.

Refractometry has also been employed recently for the determination of fibrinogen. Kaufmann (27) has given particulars of this at the 37th Congress of the German Society for Internal Medicine. Hogler and Ubberrack (25) have investigated the relationships between the refractive index in capillary, venous, and arterial blood, as also its relationship to the fibrinogen content. The results are particularly interesting from a theoretical point of view. The original method of Winternitz (74) has been discarded at the present time as not being sufficiently accurate. Somogyi (63) has recently made comparative investigations concerning the different methods and he gives preference to the method of Leendertz and Gromelski (32—34). This is founded on the principle of determining by preliminary experiments the quantity of potassium chloride in the citrated plasma which will again produce coagulation. Then the refractive index of the mixture is determined before and after coagulation and, from the two values obtained and with the aid of a formula, the fibrinogen content calculated. Further particulars will be found in a brief account by Leendertz (32).

Starlinger and Hartl (66) are the authors of a very detailed critique of all methods for the determination of fibrinogen. By employing the interferometer instead of the refractometer they were able to obtain even greater accuracy of measurement.

It is also a comparatively easy matter to determine, with the aid of the refractometer, the quantity of blood in a living person. de Crinis (12) has published particulars of such experiments. The method is founded on the measurement of the albumen content, both before and after the intravenous injection of a definite quantity of physiological solution of sodium chloride, the refractive index of which has previously been ascertained. The serum undergoes dilution by the infusion and from this the total quantity of blood can be calculated. According to de Crinis (12) the infusion causes a difference of 7 per cent. in the albumen content. So far the method has been very little used. This may be concluded from the fact that it is not described in the latest edition of the well-known work on clinical laboratory technique by Brugsch and Schittenhelm. Having regard to the rapid elimination of the injected sodium chloride solution through the kidneys, it appears more

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

suitable to employ colloidal solutions (for example, dextrine, gum acacia, etc.), which in low concentration possess a high refractive value. This method has been disputed by McQuarrie and Davis (49).

Cobet and Ganter (11) have endeavoured by the same means of injecting liquids to determine the concentration of pleural exudations, a method which is probably of more interest theoretically than when considered from a practical medical standpoint.

In recent years refractometry has also been utilised as a means of determining the hæmoglobin in the blood. The methods may with advantage be described in detail, because up to the present they are not very well known and yet are exceedingly well thought out and of interest theoretically. There are two such methods which have been worked out by J. L. Stoddard and G. L. Adair (67). By means of careful preliminary investigations it was ascertained that 1 per cent. hæmoglobin corresponds to a refractive difference of 0.0019415. Thereupon two refractometric differential methods were formed for clinical practice: the one utilises the decrease in the refraction of light by coagulation of the hæmoglobin by heat, the other the increase in the refraction of light by hæmolysis of hæmoglobin. A short description of the technique may well be added.

The "long" method.—Two c.c. of blood is put into a centrifuge and, with 0.8 per cent. solution of sodium chloride, filled up to 15 c.c.; the glass is then closed with a rubber stopper and tilted over twice. The stopper is rinsed and the glass centrifuged with medium velocity for 5 minutes. The diluted plasma is removed by means of a pipette and the glass again filled up with sodium chloride solution, thoroughly shaken and centrifuged again. After removing the upper layer of liquid, add 1 mg. saponine, fill with distilled water up to 7 c.c. and mix well with a thin glass rod. The liquid is transferred to a measuring flask of 10 c.c., and care must be taken to see that none of the liquid adheres to the glass rod or centrifuge glass. The flask is then filled with distilled water to 10 c.c. After well mixing it is centrifuged and the refractive index of the solution measured (n_1). The hæmolysed blood is then poured into a test-glass, which is closed with a loosely fitting rubber stopper, and placed in boiling water for 3 minutes. The hæmoglobin then becomes separated. The cooled tube is tilted over and the contents filtered. The refractive index (n_2) of the filtrate is also measured: it is less than that previously measured. The hæmoglobin content is then shown by the following formula:—

$$\text{g Hæmoglobin dry substance in 100 c.c. blood} = \frac{(n_1 - n_2) \times 5}{194.2}$$

The method is more involved than those usually employed for determining the hæmoglobin, but, if loss of substance is avoided in the individual manipulations, extremely good results are obtained. It must also be mentioned that, owing to the heat coagulation, the salt content alters. The authors' investigations have proved that this constitutes an error of 0.06 to 0.05 per cent. only; this can, therefore, be practically disregarded.

The second "short" method is carried out in the following way: Take two test-glasses and put 1 c.c. of blood into each. Then put 5 c.c. of a 0.8 per cent. sodium chloride solution into the first glass, and into the second also 5 c.c. of a 0.8 per cent. sodium chloride solution, but this contains 70 mg. of saponine per 100 c.c. Both solutions are then centrifuged and the refractive index (n_1 and n_2) determined. The refractive index of the salt solutions (n_3 and n_4) is also determined. The hæmoglobin content then amounts to:—

$$\text{Hgb} = \frac{\left(n_2 - \frac{(n_3 - n_4)\,0.5}{5.6}\right)0.6}{194.2}$$

The formula appears extremely complicated; the measurements to be made are, however, very simple. The calculation is further simplified by the value

$$\frac{(n_3 - n_4)\,0.5}{5.6}$$

being a constant which can be computed for the sodium chloride and sodium chloride saponine solutions, once they are mixed, and which then holds good for all investigations made with them.

Probably both methods appear more involved than those usually used in clinical laboratories, but the refractometric method of determining hæmoglobin has, above all others, the advantage of greater accuracy, although it is true that extensive experiments have not as yet been made with it. Only Gram (19) has given particulars of additional investigations. He ascertained that the values obtained by refractometric means agreed well with those found by colorimetric methods.

Pregl and de Crinis (47) have employed the refractometer for making investigations on Abderhalden defensive ferments, which, especially recently, again enjoy a wide theoretical and practical interest. Without going into details here of the basis of the reaction in itself (1) it may merely be said that the refractive index of the serum which is to be examined is first determined; it is then allowed to act upon a definite quantity of the particular organ of which the structure is to be tested, after which the refractive index is again determined. The organ powder which is manufactured in a special way does not in itself supply any soluble substance to the serum. Not until this splits up the organ-albumen do the disintegrated products dissolve and effect a change in the refraction. The difference in the refractive indices of the serum, before and after the action on the organ substances, accordingly expresses numerically the extent of the disintegration. Pregl's experiments were confirmed at the Abderhalden Institute by Hans Meyer (40). An exact description of the technical procedure of the reaction will not be given here, but it can be found in the latest edition of Abderhalden's works (1) or in Loewe's book (37) which has already been quoted on several occasions.

Schnupp (69) has successfully employed the refractometric method of Abderhalden's reaction in the diagnosis of pregnancy. Favourable results with cancer sera were also obtained by de Crinis and Mahnert (13). On the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"NORMACOL" TRADE MARK BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

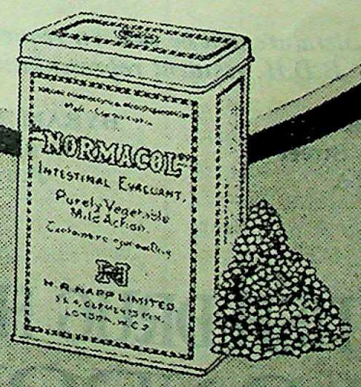
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H.R.NAPP LIMITED.

3 & 4, Clements Inn, London, W.C.2.

Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two Lines).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

For the treatment of

Hookworm Disease and for the Eradication of other Intestinal Parasites

The administration of carbon tetrachloride in cases of hookworm infestation is by far the most successful method of eradicating this parasite and, but for the variability in the degree of purity of the drug, this form of treatment would have been universally adopted.

Tetraform is a special quality of carbon tetrachloride, unique in its degree of purity; it is made in the B.D.H. chemical works by a process that ensures the production of an absolutely pure product, and it is guaranteed to be free from any toxic impurity. All risk of serious effects following its administration are, therefore, eliminated entirely.

For special convenience in administration and to ensure correct dosage Tetraform is issued in small capsules.

Tetraform capsules never fail in action, a single dose being sufficient to eradicate at least 95 per cent. of the hookworms.

TETRAFORM CAPSULES

Issued in tubes of 5 and of 20 capsules

Descriptive literature will be sent on request to either of the B.D.H. resident representatives

HENRY S. CLARK
8/10 Waterloo Street
CALCUTTA

BYRAM MISTRY
Graham's Bldgs.
Parsee Bazar Street
Fort, BOMBAY

THE BRITISH DRUG HOUSES LTD.
LONDON

Tet/In/2910

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

other hand, it should be mentioned that the results of the investigations carried out by Serjski (62) and Kuppelwieser (30) question the value of the refractometric modification of the Abderhalden reaction, and so far no definite explanation is forthcoming to clear up the points raised. Also Högler and Serio (24) considered (in 1923) that the refractometric modification of the Abderhalden reaction after Pregl was not yet suitable as a method for diagnostic purposes. Further research work has been carried out by Knipfer (28). He made investigations with the Pulfrich refractometer on sera of cancer patients, the sera being mixed, in the first place with deposits from cancerous cells and secondly with the same deposit after heat-coagulation. The figures gave a ratio of 1 : 2, which was exactly the opposite to the ratio obtained in the same way with normal sera. After *x*-ray treatment the ratio was altered in the serum of cancer cases. This showed an increase of the refractometric values on the whole, increased cytolytic power and increase of the defensive ferments. The ferment-increase was temporary and took its course approximately parallel to the reactions on proteids.

The disintegration which cancerous cells undergo in serum has been investigated by Nather and Orator (44) according to the method of Koritschoner and Morgenstern (29). They found that, beyond a certain age limit, the dissolving power of serum upon isolated cancerous cells disappears in a percentage of carcinoma-free cases, which, before this age limit, exhibited a typical power of solution in serum. Three out of every four people behaved, after their 45th year, like cancer patients, although they had no carcinoma. The authors believe that this supports the view that there is a specific disposition to cancer. It is exceedingly desirable that these interesting experiments be further extended and possibly confirmed.

The dissolving power of the serum of pregnant women with chloasma uterinum as compared with suprarenal glands has been studied with the refractometer by Fischl (15). It was found that there was a difference in the reaction of the pregnant serum according to whether chloasma contributed or not, in the sense that the addition produced an increased difference in the refractive value.

Apparently very few refractometric investigations have been made in the case of liquor cerebro-spinalis. The only work on the subject worth mentioning is that by Molnar (42), who, by determining the refractive index, has investigated the concentration of the liquor. The normal value lies in the neighbourhood of 1.33486 and 1.33517. In the case of organic diseases of the central nervous system it is higher; in the case of syphilis, the refractometric figure does not run parallel with the extent of the globulin reaction. In Molnar's opinion refractometry is to be employed, in addition to the other qualitative tests, as a convenient and accurate test.

Endeavours to utilise refractometry for the examination of the physiology and pathology of the gastric juice secretions are not new. The experiments of Obermeyer and Pick (45), in the first place, may be mentioned here. These workers were able to prove that various ferments, among them pepsin (in contradistinction to trypsin), do not alter the power of refraction for sodium light of albuminous solutions. Hirsch (23) found that this was correct. Then Kuppelwieser and Rossler (31) studied first the connection between the effect of pepsin and the increase in refraction. The numerical results are interesting and are given in detail in Loewe's book (37). The first refractometric method of determining pepsin in gastric juice, which was of service in clinics, was worked out by Schorer (70) and somewhat improved by Reiss (50). Although somewhat involved, it has nevertheless proved to be of service. Details will be found in Loewe's book (37).

It is not necessary to give a detailed description of this method here because at the present time we have a simpler one at our disposal. This has been evolved by Rostock (58 to 59) and is based on the following lines of thought. If one allows a peptic solution, whose refractive index has been determined previously, to act upon a definite quantity of an insoluble albuminous preparation, parts of this albumen dissolve in the form of disintegrated products owing to the ferment action. They acordingly effect an increase in the refractive index. Therefore, the practical determination takes place in the following way: 10 mg. of Merck's dry and powdered blood-fibrin are put into a centrifuge glass, after having previously satisfied oneself by samples taken off hand and tested that it gives off no soluble substances in distilled water. To this is added 10 c.c. of the gastric juice to be examined, its refractive index being determined beforehand. The glass is tightly closed with a rubber stopper, inverted, and placed in a water bath at 42°C. for exactly one hour. At the end of this time the glass is centrifuged so as to throw the suspended particles to the bottom, and then again examined refractometrically. The difference in the scale readings shows the quantity of pepsin. In this way the troublesome conversion to the true refractive index is avoided. I have found this method answer extremely well in numerous practical experiments.

Rostock (60) has pointed out the fact that the peptic result of a gastric juice and the acid percentage do not represent corresponding values. On the strength of this announcement Orator and Knittel have likewise interested themselves in this question, and have

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tested the method on a number of gastric patients. Details cannot be given here, but the concluding sentence of the recapitulation of the work may be quoted. "The separation of the findings into different groups of disease shows certain constitutional independencies of the pepsin values from the acidity values, which allow the value of the separate pepsin determination to be clearly seen." My own numerous investigations are still awaiting clinical tests, which will be proceeded with shortly. The results are published in Brun's Beitragen zur klinischen Chirurgie ("Contributions to Clinical Surgery").

Fischer (14) also made investigations by means of the refractometric method concerning the peptic power of gastric juice. In carrying out such tests he has especially had in mind the ionic concentration, the power of the acid addition to draw water, and the presence of salts. He comes to the conclusion that it is, of course, possible to determine only the "momentary proteolytic effect and not the quantity of pepsin secreted by the stomach." This, in my opinion, is self-implied, because as long as a ferment is not proved to be pure, it is only possible to draw conclusions as to its quantity from the extent of its effect. Orator and Knittel (46) have repudiated Fischer's criticism and see no disadvantage to the Rostock method, in that it only allows the momentary proteolytic effect of the gastric juice to be determined and not the total quantity of the secreted pepsin. Kalk (26), too, has successfully used the refractometric method of determining pepsin in various pH concentrations and saline concentrations. The varying percentage of sodium chloride, in particular, exercises a considerable influence on the peptic power of gastric juice. Consequently, when determining the peptic power of gastric juice, it is essential to pay attention not only to the acidity but also to its percentage of neutral salts.

The method of investigation was also employed successfully by Rostock (61) for the purpose of ascertaining whether a peptic solution alters in its fermentative strength after being stored for a fairly long time.

Finally, we may mention the refractometric investigation of urine. Considering the promising early stage it has not by a long way attained the importance that is actually its due. Systematic research will surely reveal results of both practical and theoretical importance. Some time ago a refractometric method of determining the sugar in urine was devised by Grober (20). Equal quantities (about 75—100 c.c.) of filtered urine are put into two glass flasks. The one flask is closed tightly with a wad of cotton-wool, and the other, after the addition of cleansed yeast, covered with a watch-glass. Both are then placed for 24 to 36 hours in an incubator. After having ascertained by the Nylander test the freedom from sugar of the fermented portion of urine, both samples are examined refractometrically. The difference in the readings, when divided by 2.9, gives the percentage of sugar.

So far as I know the method has not been used extensively. Priority claims have been asserted by Strubell (68), but his results are attacked in a controversial manner. Strubell himself arrives numerically at somewhat different results from Grober. Lemesic (35) has examined the effect of various diuretics on surviving kidneys, which have been artificially circulated with blood. Comparisons of the refractive index between the liquid which flows through and the secreted urine allow in any case of interesting deductions as to the mechanism of urine production. Detailed investigations have been made by Strubell (68) concerning the relationships between the density, lowering of the freezing-point, and the refractive index of urine. He was able to ascertain a parallel between these three values.

In the foregoing pages I have endeavoured to give a critical survey of what has been achieved by refractometrical methods of investigation for both doctor and medical student by way of valuable results. Much of this could only be given in outline, and insufficiently confirmed findings only briefly mentioned. The object of this classification is to arouse interest in the use of simple and accurate optical methods of investigation for the enrichment of our biological knowledge and the welfare of our patients.

References.

(1) Abderhalden, E. (1922). *Die Abderhaldensche Reaktion*, Berlin.

(2) Abderhalden, E. u. Wertheimer, E. Anaphylaktische Zustand. *Pflugers Archiv.*, Bd. 197.

(3) Achelis, H. (1926). Das Verhalten der Bluteiweisskörper und ihre Berücksichtigung bei der chirurgischen Indikation und Prognose. *Zentral-Bl. f. Chir.*, S. 2774.

(4) Basilico, A. (1926). Untersuchungen über Schwankungen des Refraktometewertes in Serum unter verschiedenen Versuchsbedingungen, I. Verhalten des Serumrefraktometerwertes bei experimenteller Acidose. *Riv. di patol. sperim*, Bd. I.

(5) Basilico, A. (1926). Untersuchungen über Schwankungen des Refraktometewertes bei experimenteller Avitaminose (Skorbut.). *Riv. di patol. sperim*, Bd. I.

(6) Berger u, Petschacher. *Zeitschr. f. d. ges. exp. Med.*, Bd. 36.

(7) Bergmann (1924). Refraktometrische Untersuchungen des Plasmaeiweissgehalts bei Schwangeren. *Arztl. Verein Marburg*, 19, XII, 23. Ref.: *M. m. W.*, p. 60.

(8) Brühl, F. Weitere Untersuchungen über den Serum-Eiweiss-Wert beim epileptischen Krampfanfall und seine Beziehungen zum Blutdruck. *Zeitschr. f. d. ges. Neurol. u. Psychiatrie*, Bd. 83.

(9) Burger, K. (1926). Uber das Verhalten des Serumeiweisses nach Operationen. *Magyar orsovi arch.*, Bd. 27.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

***Vide* Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.**

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ALIMENTARY TOXAEMIA

Laboratory v. Clinical Results

The swing of the pendulum has recently caused certain bacteriologists to question the importance of alimentary toxaemia in the causation of a wide variety of diseases, on the ground that their faecal bacterial counts are so untrustworthy that no standard of pathogenesis can be identified with any particular type of flora.

This, as most Medical Practitioners are aware, by no means represents the opinion of the great majority of Laboratory Experts, in whose hands the matter may be left for final settlement.

Meanwhile, the experienced Clinician will be guided by the results he obtains when ordering an approved non-toxic bactericide in the treatment of putrefactive and other bacterial invasions of the intestinal tract; and the more potent and less toxic the bactericide, the more assistance he will have in his other measures of treatment.

Medical men who have continued to rely on Dimol in the treatment of intestinal disabilities of bacterial origin since it was first introduced to the Profession in 1921 will be interested to learn that after long and thorough investigation

DIMOL PULVERETTES ARE NOW SUPPLIED BY THE ADMIRALTY FOR USE IN HIS MAJESTY'S SHIPS AND ROYAL NAVAL HOSPITALS.

DIMOL LABORATORIES, 40, Ludgate Hill, LONDON, E.C.4.

Dimol can now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(10) Burger, K. (1926). Uber das Verhalten des Serumeiweisses nach Operationen. *Zentralbl. f. Gynakol.*, p. 294.

(11) Cobet und Canter (1926). Uber die Grosse von Pleuraergussen. *Deutsches Arch. f. klin. Med.*, Bd. 132.

(12) Crinis, de. (1917). Eine neue Methode zur Bestimmung der Gesamtblutmenge des lebenden Menschen. *Zeitschr. f. physiolog. Chemie.*, Bd. 99.

(13) Crinis, de. und Mahnert. (1918). Uber den serologischen Carcinomnachweis. *Fermentforschung*, Bd. 2.

(14) Fischer, H. (1925). Beitrag zur Beurteilung der refraktometrische Magensaftuntersuchung. *Klin. Wochenschr*, p. 1111.

(15) Fischl, F. (1923). Das Abbauvermögen des Serums Gravider mit Chloasma uterinum gegenüber Nebenniere (Refraktometrische Untersuchungen). *Dermatol. Zeitschr.*, Bd. 38.

(16) Gänsslen, M. (1922). Die Blasenmethode, eine Funktionsprufung auf Odembereitschaft resp. Odemtorpiditat. *M. m. W.*, p. 1176.

(17) Gänsslen, M. (1923). Ergebnisse der Blasenmethode. *M. m. W.*, pp. 1015—1271 und *M. m. W.*, (1924), p. 188.

(18) Gänsslen und Maier (1927). Refraktometrische und viskosimetrische Serienuntersuchungen im Blutserum Tuberkuloser. *Zeitschr. f. Tuberkulose*, Bd. 40.

(19) Gram, H. C. (1926). Die refraktometrische Bestimmung des Hämoglobins. *Acta. med. scandinav.*, Suppl. Bd. 16.

(20) Grober, J. A. (1900). Quantitative Zuckerbestimmungen mit dem Eintauchrefraktometer. *Zentralbl. f. inn. Med.*, p. 201.

(21) Herlitzka, A. (1907). Recerche sulle indice di rifrazione delle soluzioni di proteine in presenza di elettrolite. *Biologica*, Bd. 1.

(22) Hirsch, Paul (1920). Der Brechungsindex im Dienst der physiologischen Chemie. *Zeitschr. f. angew. Chemie*, Nr. 88.

(23) Hirsch, P. (1917). *Fermentmethoden.* G. Fischer, Jena.

(24) Högler, F. u. F. Serio. Untersuchungen über den klinischen Wert der Abderhaldenschen Reaktion mit besonderer Berucksichtigung der Pregl-schen Methode. *Wiener Arch. f. klin. Med.*, Bd. VII.

(25) Högler, F. u. K. Uberrack (1926). Studien über das refraktometrische Verfahren. *Klin. Wochenschr*, Nr. 44.

(26) Kalk (1927). Beitrag zur Frage der Wirkungsbedingungen des Pepsins. 6. *Tagung der Ges. fur Verdauungs-u. Stoffwechselkrankh.*

(27) Kaufmann, Neue Methoden und Mikromethoden der refraktometrischen und interferometrischen Bestimmung des Figrinigens. 37. *Kongr. d. deutschen Ges. f. innere Medizin.*

(28) Knipfer, A. (1922). Ricerche refraktometriche sul siero di di carcinomatosi. *Rass. intern. di clin. e terapia*, anno III, Br. 9.

(29) Koritschoner u. Morgenstern (1920). Refraktometrische Untersuchungen über die Reaktion zwischen isolierten Krezszellen und Blutserum (Freund-Kaminersche reaktion). *Biochem. Zeitschr.*, Bd. 104.

(30) Kuppelwieser (1924). Versuche über die Nachweisbarkeit immunisatorisch bedingter Fermentprozesse, I—II. *Biochem. Zeitschr.*, Bd. 145.

(31) Kuppelwieser u. Rössler (1923). Beitrag zur Untersuchung des Magnesafts auf seine eiweisslosende Wirkung. *Biochem. Zeitschr.*, Bd 136.

(32) Leendertz, G. (1923). Eine klinische Methode zur Bestimmung des Blutfibrinigens. *Klin. Wochenschrift*, p. 746.

(33) Leendertz, G. 1st Serum zu quantitativen Blutuntersuchungen brauchbar? *Deutsche Arch. f. klin. Med.*, Bd. 140.

(34) Leendertz, G. u. B. Gromeleki. *Arch. f. exp. Pathol. u. Pharmakol.*, Bd. 94, 95.

(35) Lemesic (1923). Prüfung diuretischer Mittel an der isolierten Kaninchenniere. *Klin. Wochenschrift*, p. 1455.

(36) Löwe, Fritz (1921). Refraktometer in Fabriklaboratorium. *Chemikerzeitung*, Bd. 45.

(37) Löwe, Fritz (1925). Optische Messungen des Chemikers und des Mediziners. *Technische Fortschrittsberichte*, Bd. VI. Dresden u. Leipzig.

(38) Mark, Robert. Uber den Einfluss von Ernahrungsfaktoren auf den Serum-Eiweiss-Gehalt. *Pfluger's Archiv.*, Bd. 212.

(39) Masing u. Denecke. Beitrag zum Studium der Durchlassigkeit der Kapillarwände. 34. *Kongr. d. deutschen Ges. f. inn. Med.*

(40) Meyer, H. (1921). Studien zur Methodik der refraktometrischen Serumuntersuchung auf Abwehrfermente. *Biochem. Zeitschr.*, Bd. 114.

(41) Meyer, M. u. F. Brühl. Zur Pathologie des epileptischen Krampfanfalls. *Zeitschr. f. d. ges. Neurol. u. Psychiatrie*, B. 75.

(42) Molnar, A. L. Uber die Bestimmung der Liquorkonzentration mit Hilfe des Refraktometers. *Deutsche Zeitschr. f. Nervenheilkunde*, Bd. 79.

(43) Molnar, A. E. (1923). Uber die Refraktion der menschlichen Lumbalflüssigkeit. *Klin. Wochenschr*, S. 790.

(44) Nather u. Orator. Refraktometrische Serumuntersuchungen über Krebskrankheit und Disposition. *Mitt. a. d. Grenzgeb. d. Medizin und Chirurgie*, Bd. 35.

(45) Obermeyer u. Pick (1906). *Beitrage zur chemischen Physiologie und Pathologie*, Bd. 7.

(46) Orator u. Knittel (1926). Klinische und experimentelle Beiträge zur Ulcusfrage. *Deutsche Zeitschr. f. Chir.*, Bd. 196.

(47) Pregl u. de Crinis (1917). Uber den Nachweis von Abwehrfermenten in kleinsten Serummengen. (Mikro-Abderhalden-Reaktion.) *Fermentforschung*, Bd. 2.

(48) Pueddu (1925). L'indice refrattometrico del siero di sangue nella vicchiana. *Morgagni.*

(49) Quarrie, Mc. u. Davis (1920). *Amer. Journ. of Physiol.*, Bd. 51.

(50) Reiss, E. (1923). Die refraktometrische Pepsinbestimmung im Mageninhalt. *Schweizer med. Wochenschr.*, Nr. 13.

(51) Reiss, E. Anwendung der Refraktometrie in der Physiologie und Pathologie des Menschen. *Zeitschr. f. Elektrochemie.*

(52) Reiss, E. (1913). Die refraktometrische Blutuntersuchung und ihre Ergebnisse für die Physiologie und Pathologie des Menschen. *Ergebnisse der inneren Medizin u. Kinderheilkunde*, Bd. X. (*Mit zahlreichen Literaturangaben.*)

(53) Robertson. *Journ. of Biol. Chem.*, Bd. 11, 32.

(54) Roffo, u. J. B. Rivarola. Uber eine refraktometrische Eigenschaft des Serums Krebskranker. *Boletin del Instituto de Medizina Experimental*, Ano. 1, Nr. 5.

(55) Rohrer, F. (1922). Refraktometrische und viskosimetrische Untersuchungen am Blutserum. *Schweizer med. Wochenschr.*, Nr. 22.

(56) Rohrer, F. (1922). Zur Bestimmung des Albumin, Globulin Mischungsverhältnisses im Blutserum. *Schweizer med. Wochenschr*, Nr. 32.

(57) Rohrer, F. (1917). *Deutsches Archiv. für klinisch Medizin.*, Bd. 121.

(58) Rostock, P. Refraktometrische Bestimmung der verdauenden Kraft verschiedener Pepsinproparate gegenuber tierischem Fibrin. *Zeitschr. f. d. ges. exp. Med.*, Bd. 39.

(59) Rostock, P. Quantitative Pepsinbestimmung auf refraktometrischem Wege. *Zeitschr. f. d. ges. exp. Med.*, Bd. 42.

(60) Rostock, P. (1924). Pepsinbestimmung im Magensaft. *M. m. W.*, Nr. 38.

(61) Rostock, P. (1926). Untersuchungen über die Haltbarkeit von Pepsinlosungen und über die Herstellung keimfreier Fermentpraparate. *Fermentforschung*, Bd. IX

(62) Serejski (1924). Gibt es spezifische Abwehrfermente. *Biochem. Zeitschr.*, Bd. 152.

(63) Somogyi, S. Zur refraktometrischen Bestimmung des Fibrinogens. *Zeitschr. f. d. ges. exp. Med.*, Bd. LIII.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(64) Szenes, A. Uber den Gehalt des Blutes an Kalk, des Serums an Aminosauren bei Strumen und einem Falle von Myositis ossificans, nebst refraktometrische Bestimmungen. *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, Bd. 36.

(65) Szulislawska u. Toziczyk. Uber Refraktometrie in der Diagnostik des Erstickungstodes. *Deutsche Zeitschr. f. d. ges. gerichtliche Medizin.*, Bd. 9. H. 1.

(66) Starlinger u. Hartl. Uber die Methodik der quantitativen Bestimmung des Fibrinogens. *Biochem. Zeitschr.*, Bd. 157.

(67) Stoddard, J. L. u. G. L. Adair (1923). *Journ. of Biol. Chem.*, Bd. 57.

(68) Strubell, A. (1901). Uber eine neue Methode der Urin-und Blutuntersuchung. *Deutsches Arch. f. klin. Med.*, Bd. 69.

(69) Schnupp, J. (1926). Uber die refraktometrische Methodik der Abderhaldenschen Reaktion. *D. m. W.*, S. 913.

(70) Schorer, G. (1908). Uber refraktometrische Pepsinbestimmung. *Diss. Bern.*

(71) Schretter, G. (1926). Der spezifische Brechungszuwachs des Gesamteiweisses im Blutserum. *Biochem. Zeitschr.*, Bd. 177.

(72) Schretter, G. Der spezifische Brechungszuwachs von Serumalbulin und Serumglobulin. *Biochem. Zeitschr.*, Bd. 177.

(73) Wanner, F. (1922). *Schweizer med. Wochenschrift*, Nr. 32.

(74) Winternitz. *Arch. f. Dermatol. u. Syphilis*, Bd. 101.

(75) Wiechmann, E. u. H. Horsters. Studien über experimentelle Infektionskrankheiten. I. Mitteilung. Uber das Serumeiweissbild bei der experimentellen Rekurrensinfektion der Ratte. *Deutsches Arch. f. klin. Med.*, Bd. 151.

(76) Zimmer, H. Klinisch experimentelle Untersuchungen über Blutserumkonzentration bei Arsenkuren. *Zeitschr. f. d. ges. exp. Med.*, Bd. 30, S. 325.

Current Topics.

Sedatives in Labour, Particularly "Twilight Sleep."

By JOHN S. FAIRBAIRN, M.A., B.M. (Oxon.), F.R.C.P., F.R.C.S.

(Abstracted from *Brit. Med. Journ.*, April 27th, 1929, p. 753.)

A SEDATIVE may be indicated early in labour when the onset of the true rhythmic pains is delayed, and the woman is worried and fatigued by short, sharp pains that appear to do no good, or by a period, perhaps a day or more, of "niggling" pains, before the long, steady, and useful contractions are established. Also when the patient is tiring any time before the os is fully dilated and the head low in the pelvis. If she is left alone she may lose self-control, weep and throw herself about, and later become played out, and her uterus will not function properly. A hypodermic injection of morphine should be given when she is tiring, and before she is tired; the rest and comparative relief will enable her to regain her self-control, and uterine action will return with fresh strength after a period of rest. The relief to the patient also brings relief from the insistent pressure of distracted relatives that is so trying in domiciliary midwifery.

Another indication for the use of a sedative is what is called rigidity of the os. Commonly it is spasmodic, organic rigidity being very rare, and is most often met with in nervous, highly strung, but perfectly healthy primiparæ. This rigidity is not to be considered as a specific condition of the cervix, for it is merely the expression of poor or erratic uterine action; with good contractions there will be good dilatation, with poor contractions poor dilatation. Rigidity frequently accompanies the cases already described in which the pains are short and sharp and without rhythm, some times termed "colicky" action. The rigid os is to be regarded as a sign of disordered uterine action, and of the kind that yields to an opiate or other sedative.

Whenever there are signs of commencing fatigue, loss of control, and irregular uterine action, a liberal dose of some sedative should be given and repeated if need be. Practically all our emergency cases of delayed labour sent into hospital for immediate delivery—in many of which premature efforts at instrumental delivery have been made—are given morphine ($\frac{1}{4}$ or $\frac{1}{3}$ grain), and it is surprising how many of those without gross mechanical difficulties will deliver themselves after four or five hours' sleep—and sometimes catch us out by performing an unlooked-for "B.B.A." My experience of this type of case in hospital and of cases seen outside that take on a fresh aspect after a few hours' sleep has made me feel that enough use is not made of a sedative sufficient to secure for the patient a rest before resort is made to artificial delivery. If the head is near the outlet it is too late to secure rest, and simpler to try first an injection of pituitrin as a stimulant to uterine action, and if not successful in a quarter of an hour to deliver by the forceps. Also, morphine at this stage is liable to result in the fœtus being born narcotized.

Twilight Sleep.

The morphine-hyoscine narcosis, or "twilight sleep" (Gauss), must be regarded neither as an anæsthetic nor an analgesic, for its aim is the production of amnesia of the events throughout labour. Its success is complete if the mother awakes from sleep or drowsiness following her delivery without any recollection of what she has been through, and if neither she nor her infant shows any ill effect from the narcosis. Dulling of pain to some degree is usually obtained, but the real objective is to abolish the memory of the recurrent pains, and thereby their psychical effects. The patient may groan during uterine contractions, wake up and perhaps raise her head and shoulders from the bed, exhibit the facial expressions of pain, and even complain bitterly and emphatically, but will sink back into a recumbent position and drowsy state when the contraction passes off, and no mental impression that can be recalled will remain. The successful induction of amnesic narcosis removes almost entirely the inhibitions of uterine action of emotional and psychical origin, greatly lessens fatigue, and increases the chances of rapid recovery without the nervous exhaustion that may follow a painful and trying experience in a sensitive subject.

It may be said that labour in such circumstances is not physiological, and it is true to the extent that drugging of a patient in this way diminishes the reflex response to those stimuli augmenting the strength of the contractions; but, on the other hand, it represents the attempt to remove those factors interfering with good expulsive power that the circumstances of our modern social life have brought about. Its use will be justified if the cases in which the narcosis is adopted are limited to those in which the avoidance of fatigue and the exclusion of inhibitory factors will give greater benefit than the disadvantages of lessening reflex response.

Method.

It is best to begin as soon as rhythmical labour pains are definitely established and cause distress. Some would have a degree of dilatation of the os to a size admitting one or two fingers, but examinations for the purpose of determining the amount of dilatation are not advisable. As will be explained later, it is, however, nearly always possible to begin induction after labour has been in progress some time by starting with light chloroform anæsthesia.

It is very important that the usual preliminaries preparatory to labour, particularly a thorough emptying of the bowels, should be got over before induction of the narcosis is begun, in order to lessen disturbance of the patient. Isolation and quietude for the patient are essential, to exclude so far as possible all external stimuli. She should be shaded from the light, her ears plugged with wool, and disturbed as little as close watching of her condition and the necessary attentions will allow.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Surely, you mean

For 40 years of Aspirin no one has yet succeeded in making a preparation which comes up to the standard of original

"BAYER'S ASPIRIN."

BAYER

"BAYER'S" ASPIRIN

(1) does not easily disintegrate.

(2) never contains free acetic or salicylic acid.

(3) never contains adulterating mixtures.

ASPIRIN

Literature and full particulars on application.

HAVERO TRADING Co., Ltd., CALCUTTA,

Pharmaceutical Dept., Bayer-Meister-Lucius

P. O. Box No. 2122, 15, Clive Street, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Atophanyl

Schering

for the
parenteral application
of Atophan specially indicated in
obstinate cases of acute and chronic
arthritis, muscular rheumatism, sciatica, neuralgia, etc.
For intravenous injection: boxes containing 5 ampoules each of 10 cc.
For intramuscular injection: " " 5 " " " 5 "

Samples and literature at the disposal of medical men on request.

SCHERING-KAHLBAUM (INDIA), LTD., CALCUTTA

4, Dalhousie Square, P. O. Box No. 2006 — Telephone: Cal. 4770, Telegrams: Aeskulap.
T. M. THAKORE & CO., Bombay: 24, Churchgate Street — Madras: P. O. Box No. 249.
MALLIK, THADHANI & CO., Karachi: Central Bank Buildings, P. O. Box No. 164.
F. SCHWERZMANN & CO., Rangoon (Burmah): 26, Merchant Street.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The dosage is best described by taking a standard one and suggesting modification in one or other direction in certain conditions. The usual initial dose is 1|4 grain of morphine with 1|150 grain of hyoscine, followed at hourly intervals by 1|450 grain of hyoscine. The morphine is rarely increased beyond 1|4 grain, and is repeated only in special circumstances and in smaller quantity, but the hyoscine may be increased to 1|100 grain for the initial dose, or more often to 1|300 grain for the second dose if the response to the usual initial dose is insufficient. The general rules for determining the best dosage in the individual case may be stated thus. The standard dose should be increased in first labours and for big women of strong physique, and for imaginative, oversensitive, and nervous patients. Morphine 1|6 grain and hyoscine 1|450 grain will suffice for multiparæ, for women of a small or frail build, and for those of an easy-going unimaginative type. If begun early in labour, and the patient is a big, strong primigravida intolerant of pain, the first dose should be morphine 1|4 grain and hyoscine 1|100 grain, the frequency of the injections and dosage of hyoscine afterwards being determined by the effect obtained. Idiosyncrasy to hyoscine must be watched for, and the subsequent injections lessened if need be.

The standard time for the subsequent injections of hyoscine is, roughly, at hourly intervals, but in practice the frequency is determined by the effect produced, the memory test being adopted as an index of the amnesic state. The time of the second injection may be anticipated if the response to the first is feeble, but, generally speaking, it is better to keep to the 1|450 grain at shortened intervals rather than increase the amount to 1|300 grain, unless very little effect has been obtained from the first dose.

The memory test is carried out by taking some fairly common object that will not greatly tax the patient's muddled intelligence to recognize, showing it to her, and asking what it is. An hour or so later she may be roused, and asked what she was shown. If she has no recollection of it, the object is produced and the question repeated. If the object presented to her brings back no glimmer of its previous presentation, amnesia is complete. The test is not reliable; often women are able, by an effort at the time, to remember objects previously shown, but are found to have lost all memory of the events in the labour after it is over. Also repeated rousing for this purpose is an interruption to the narcotic state. The test should not be begun till after the second or third injection, and, so far as possible, should be carried out when the patient is disturbed for some other reason—for example, for a drink, a hypodermic injection, to pass water, or have a catheter passed. Also, if any attention of this kind of a sufficiently distinctive character is repeated, the opportunity can be taken to see if the memory of the previous occasion remains.

With further experience the need for repeating the hyoscine injections can be largely determined by noticing whether the patient is fully under the influence of the drug and by watching for signs of overdosage. When fully narcotized she should be drowsy, dosing between pains, but wakened up by them, and relapsing at once into drowsiness again. Should she show no evidence of disturbance during the pains no further injections should be given until some effect becomes noticeable. Usually, after the second or third injection, an interval of two or more hours may be allowed before the next one, provided quietness and drowsiness continue.

Flushing of the face and dilatation of the pupils are usually present early and are not necessarily indications of overdosage. The pulse and respiration rate should be carefully observed, as any marked alteration either in the direction of slowing or quickening is an indication for ceasing administration for a time. With overdosage the pulse rate is increased and the respiration rate slowed, and therefore a watch should be kept on any disturbance of the ratio between the two. Usually there is at first some slowing of the pulse rate, probably from the previous excitement and subsequent quietude. When once the pulse rate has settled down, however, it should not alter greatly.

Unfortunately patients are very variable in their response to hyoscine; most of them conform to the type described—sleepy or drowsy between pains but roused by them. Some, however, may remain awake and yet be found afterwards to have complete amnesia, and others may become restless and troublesome. There is always considerable mental confusion, but unless it is associated with excitement and difficulty in controlling the patient, it is not an indication for interfering with the injections. Some degree of restlessness is usual in the early stage, before the complete effect of the drugs is obtained, but in occasional instances it may become very troublesome. It is an indication of overdosage with hyoscine, and may require further administration to be discontinued. A watch must be kept on the bladder, and if the patient is unable to empty it voluntarily the catheter must be passed. Thirst is always well marked and leads to frequent drinks being given. Food, usually liquid, must be given in all lengthy cases.

It will be clear from this general account of its administration that the amnesic narcosis calls for the continuous observation of the patient by a skilled nurse and constant attention by the practitioner in charge. The patient may appear quiet and yet wake up suddenly and in her mental confusion, get up and wander about and do strange things—for example, hide herself or try to escape. No bowls of poisonous lotion should be left within easy reach, for thirst may drive her to sample the first fluid that comes to hand. Also, to get good results calls for experience in the method.

There are sundry modifications that make its partial use easier to those with little experience of it. Its effects are most valuable in the first stage of labour. In the second stage when the stronger expulsive pains and the distension of the outlet are likely to rouse the patient, resulting in her reconstructing the whole labour and making the induction a failure, it is often easier to fall back on a light general anæsthesia, especially once the outlet begins to gape and birth is imminent. If that is done, it may not be "twilight sleep," but amnesia is secured. Also, if the injections have been discontinued or the patient is out of control, chloroform anæsthesia may be induced—just sufficient to allow of a full examination being made—and if the os is not fully dilated or the head not deep in the pelvic cavity, another injection of morphine—a small dose, say 1|8 grain—may be given which will take effect before the general anæsthesia is recovered from.

The great objection to the routine adoption of this form of narcosis in labour is, to my mind, its undoubted effect in lessening the expulsive contractions of the uterus and voluntary bearing-down efforts, and thereby increasing the number of low forceps operations. The effect on the child—which appears to be almost entirely due to morphine—is of minor moment, as, though born apnœic and disinclined to breathe, if left alone respiration will be established in a short time. The injection of pituitrin 1|2 c.cm. (that is, up to 5 units) will reduce the number of forceps deliveries, but leave them still above the average, as we found when the method was tried out in a series of cases not specially selected as suitable. The effects on the third stage are not noticeable. Hence my view is that both a careful selection of cases should be made and strict adherence to Gauss's method left to those with long experience of it.

Selection of Cases.

It is valuable for all patients in whom a long and tedious labour may be anticipated, particularly cases of slight disproportion between the head and pelvis, when a long time for moulding is essential. Many of these cases would be of the kind designated as "trial" labours, and in them it is undoubtedly of great service in lessening fatigue; as soon as the head is well down further administration of hyoscine may be stopped, and, if the patient delivers herself, a little chloroform given during the birth of the head. If delivery by forceps is required, anæsthesia is necessary. It is also useful in cardiac cases that have been under ante-natal treatment for decompensation, by lessening fatigue and strain during labour.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Apart from cases in which there is a cause or clear reason for avoiding fatigue, this method is adopted occasionally for cases in which the temperament or excitable state of the patient, especially if associated with a slow and erratic onset of labour, suggests it. It is often asked for by women who have either had a trying experience in a previous labour or have a great dread of what is before them and are without confidence in their unaided powers of going through it. It is always advisable in a medical school to select cases of this type now and then for instructional purposes, so as to keep nurses and students acquainted with the method.

Ovarian Therapy.

(Abstracted from *The Prescriber*, Vol. XXIII, May, 1929, p. 199.)

There are many ways in which ovarian therapy should be of use, and indeed empirical, or semirational, applications have proved this beyond question; for example the stimulation of puberty in the relatively common case of delayed menstruation, and of course, the mitigation of menopausal symptoms in natural or artificial menopause. A few cases of hypo-ovarianism probably result in sterility, and these might well benefit under the stimulating influence of ovarian therapy; such cases are widely reported. The indiscriminate exhibition of ovarian extracts in sterility could not be defended, however, as it is quite clear that the majority of these cases are due to inflammatory conditions and displacements. The interruption of pregnancy is another possibility pointed out by animal experiment, and if expectations are maintained, this should be a very useful method of induction in contracted pelvis. It is of course an easy matter to produce abortion in laboratory animals, and notoriously difficult to do so in woman; without putting any significance upon it, we may mention that a case was reported privately of a woman who induced abortion by taking œstrin by the mouth.

Novak (Baltimore) since 1922 has written much on this subject which has acted as a salutary break on undue enthusiasm, and in his last paper he maintains this sceptical attitude, perhaps, if we may say it with respect, rather too much so in the face of recent developments. In addition to the indications listed above, he mentions the following conditions which might benefit under ovarian medication: amenorrhœa, hypomenorrhœa, oligomenorrhœa, and premature menopause; possibly some cases of so-called primary dysmenorrhœa, genital hypoplasia, obesity, repeated abortion, and menstrual headaches. The condition of "hyperfunction" of the ovary, Novak points out, is a controversial one, and he can only find one scientifically substantiated pathological entity which can be ascribed to it, namely "functional uterine bleeding." This is due to persistence of the follicular phase, probably with an enhanced activity, and can be treated successfully with corpus luteum extracts when such are really potent. Uhlmann has of course purified a very active product containing the internal secretion of the luteal tissue, which was first separated by Seitz and Wintz.

Among recent reports of successful ovotherapy is one by Elsner (Prague), in which 13 cases of amenorrhœa (various ages) were treated with "homovar," an extract of cattle ovary liquor folliculi prepared by electrodialysis. Then Cohn emphasizes that the chief symptoms of ovarian deficiency are psychic, and such as are loosely termed "neurasthenia." Intravenous aqueous ovarian extracts, combined with diathermy to the ovaries, produced good results in fifty cases. Seguy had good results in treating ovarian insufficiency by means of preparations from the healthy human ovaries removed at operations for salpingitis or ectopic pregnancy. This work has been adversely criticized on ethical grounds. Yet another technique has been adopted in a few cases by Zwolinski (Warsaw) who used 5-6 c.c. of blood-serum from women in the last eight weeks of pregnancy, on the ground that it contains both the ovarian hormone and that of the anterior lobe of the pituitary. Nine cases of congenital or premature amenorrhœa were improved, but complications occurred in two. Two cases of hyperemesis gravidarum are said to have been cured, but no significance can be attached to this.

In a cautious and critical paper Posch (Innsbruck) discusses the use of sistomensin, the oil-soluble œstrus-producing hormone, and agomensin, the water-soluble principle of the corpus luteum. He treated a variety of pathological states from insufficient menstruation to uterine hypoplasia and menorrhagia, metrorrhagia, etc. Sistomensin produced very good results in 13 cases, good results in 14, and no response in 13. This type of report is one which carries much more conviction than many of a more glowing nature. Similarly agomensin had excellent effects in 21 cases, definite results in 18, and no results in 12 cases; this preparation was most effective in hypoplasia and functional amenorrhœa. Sistomensin was most effective in the hæmorrhages of puberty.

Hirst (Philadelphia), in treating 17 cases of menstrual disorder and sterility, used "estrogen" and produced relief of "sexual frigidity," and after excluding *all* other possible causes of sterility had apparent success in patients with normal menstruation. Estrogen is a placental extract first described by Firestone, who treated twelve cases with it, and reports good results in six; the condition being nervous manifestations of ovarian deficiency. Yet another new preparation is "progynon," a water-soluble type of œstrin described by Streck (Wurzburg), which is active given by the mouth, and gave good results in amenorrhœa. Hannan (London) has also demonstrated that œstrin is active per os, although sixty times the dose is required. This is of course a very valuable discovery for the clinician. Haultain (Edinburgh) found, however, that cases of artificial menopause responded better to treatment both by injection and orally, than by the latter alone. King and Patterson (Baltimore) disagree with these results and state that corpus luteum, and whole ovary by mouth, and œstrin hypodermically, are probably useless in relief of menopausal symptoms.

Yet another method of treatment of menstrual disturbances is discussed by Drips and Ford (Rochester, Minn.) who adopted radiation, as has, of course, been much used both in England and on the Continent. They believe an essential hypo-ovarianism exists in cases of primary oligo- and amenorrhœa, and of menorrhagia and metrorrhagia. The evaluation of the method is difficult owing to the occurrence of spontaneous remissions; and in addition they combined their treatment with such measures as iron, vitamins, agomensin, sedatives, etc.

The main impression gained from this series of papers is that only small numbers of cases are reported, but the tone is decidedly hopeful. In addition there is much more caution expressed by most authorities than would be found in similar papers of eight or ten years ago. The indications are improving, but one is at present justified only in saying that ovarian therapy holds out good prospects of cure or amelioration in many conditions, if extracts from reputable firms are used and are chosen at least with some care. The blind use of "ovarian extract" in any gynæcological complaint can never be defended.

The Treatment of Blackwater Fever by Oral Sodium Bicarbonate.

By C. C. CHESTERMAN, O.B.E., M.D., M.R.C.P. (Lond.)

(*The Lancet*, Vol. CCXVI, June 29th, 1929, p. 1355.)

In view of the successful treatment of blackwater fever by intravenous sodium bicarbonate recently reported, the following case is of interest in that the patient's second attack of blackwater fever, and a relapse following it, both yielded within 24 hours to large oral doses of sodium bicarbonate, whereas his first attack 13 months previously, treated by other methods, was of a very serious and prolonged nature.

The patient, a man aged 23, was employed on a rubber and coffee plantation. In June 1927, he arrived in the Congo. He was very irregular in taking quinine and had occasional malarial fever. In February 1928, he had his first attack of blackwater fever, being admitted to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CAPROKOL

(Hexyl-resorcinol B.D.H.)

For the complete disinfection of the urinary tract Caprokol is *"the drug of choice."*

Pain, frequency and the allied unpleasant symptoms characteristic of diseases of the urinary system are relieved immediately by Caprokol treatment.

The physician who prescribes Caprokol witnesses a rapid improvement in the general health of his patient as a result of the comfort experienced by night as well as by day. The necessity for frequent micturition ceases, hours of continuous sleep follow, the appetite increases; most important of all, however, is the continuous germicidal action of the drug.

In Capsules for Adults
In Solution for Children

Descriptive literature and clinical reports will be sent on request to the B.D.H. representatives in India

HENRY S. CLARK
8/10 Waterloo Street
CALCUTTA

BYRAM MISTRY
Graham's Bldgs.
Parsee Bazar Street
Fort BOMBAY

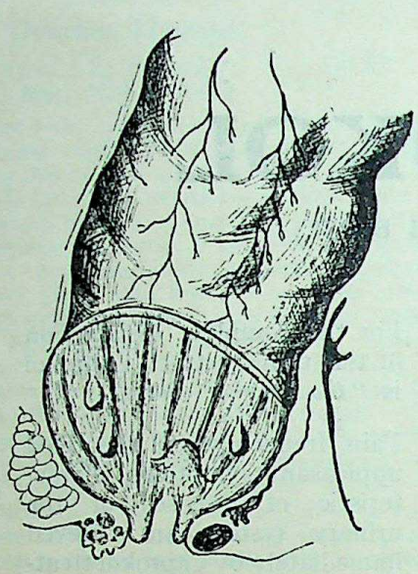
THE BRITISH DRUG HOUSES LTD.
LONDON

Ca In 291v

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The Haemorrhoidal Circle



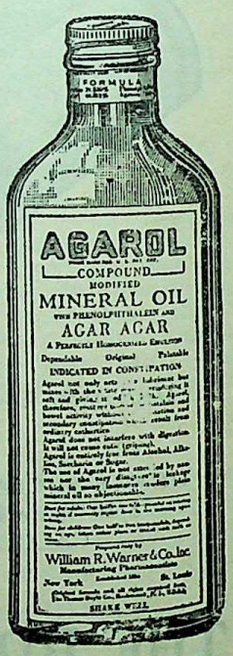
Internal and external hæmorrhoids resulting from pressure upon the blood vessels and obstruction of the circulation in the rectum.

DISTENTION of the rectum from painful defæcation—pressure on the rectal blood vessels — impeded circulation — hæmorrhoids. Cathartics to relieve the constipation —irritation of the mucous membrane and the existing hæmorrhoids — pain — possible anal fissure — cessation of purging—constipation.

Such is all too frequently the vicious circle of dyschezia and hæmorrhoids, a combination which requires appropriate local treatment and a bowel corrective that will not irritate.

AGAROL, the original emulsion of mineral oil, agar-agar and phenolphthalein, is pre-eminently indicated for the correction of the vicious circle.

AGAROL lubricates, therefore prevents irritation by friction; it segments and softens the fæcal mass, and thereby prevents possible excessive strain in the expulsion of it; it stimulates the peristaltic force without the shock of cathartics.



Agarol is the *original* Mineral Oil—Agar-Agar Emulsion (with Phenolphthalein) and has these advantages:

Perfect emulsification; stability; pleasant taste without artificial flavouring; free from sugar, alkalies and alcohol; no oil leakage; no griping or pain; no nausea; not habit forming.

WILLIAM R. WARNER & CO., INC.
Manufacturing Pharmaceutists Since 1856,
113-123 WEST 18th STREET,
NEW YORK CITY.

Agents in India:—
MARTIN & HARRIS,
8, Waterloo Street, Calcutta;
119, Parsi Bazar Street, Fort, Bombay;
and 20, Sunkurama Chetty Street, Madras.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

hospital on the second day with oliguria and exhaustion. Hæmoglobinuria continued for a week and the treatment was by intravenous glucose, rectal salines, cupping to loins, hot baths, etc.

The present attack began on March 17th, 1929, when he was feverish and bilious and took two doses of 0.5 g. quinine hydrochloride in capsules. On the following day, in spite of fever, he went to work at dawn until he noticed that his urine was dark red. He was transported on an improvised stretcher to the river side and reached hospital in a steamer five hours later. On admission his temperature was 39.7°C. and his pulse-rate 68. He twice vomited brownish bile-stained gastric juice and had one dark liquid motion. The spleen was just palpable.

Treatment was confined to the administration of as much natural lemonade, Vichy water, and tea without milk, as could be taken, 1 to 3 g. of sodium bicarbonate and as much powdered glucose being added to most of the feeds.

The following points are of interest in this case:—(1) Both in the initial attack and the relapse the disappearance of hæmoglobin from the urine, which was formerly acid, followed a few hours after it showed an alkaline reaction. (2) This was effected solely by the oral administration of sodium bicarbonate (and the citrates of lemonade) in doses up to 21 g. in 24 hours. Bilious vomiting which caused rejection of the first few doses was controlled by frequent sips of this alkaline fluid. (3) The relapse on the tenth day followed a couple of 0.6 g. (10 grains) doses of quinine when the urine was acid, whereas 1.2 g. (20 grains) was taken with impunity ten days later when the urine was kept alkaline. (4) Sodium bicarbonate in large doses is easily detected in the urine by the effervescence of CO_2 caused by the addition of an acid. The hæmoglobin in such urine gives a very slight cloudy precipitate on boiling, whether previously acidified with acetic acid or not, possibly on account of the formation of alkaline hæmatin. Nitric acid, however, throws down a heavy cloud.

Although in this case the illness was precipitated by quinine, it was definitely not a case of quinine hæmoglobinuria, for the patient showed no sign of quinine idiosyncrasy before or after the attack. Moreover, its association with an enlarged spleen, bilious vomiting, and jaundice leaves no doubt that it was a case of true blackwater fever. The case can be written down as but of slight severity, only on the ground that it continued for so short a period, and it is suggested that the early treatment, within six hours of onset, definitely aborted what might have been an attack as serious as the first one.

Such simple treatment is available immediately for any sufferer, however far removed from medical attention. The pre-blackwater state should similarly be treated with small doses of quinine combined with generous doses of alkali taken some hour or so before. It is hoped that medical men practising in endemic areas will make known the possibility of such treatment of this dangerous and much dreaded disease, and will report in confirmation or failure as results occur, for any single practitioner has as a rule to wait some years in order to collect a series of cases.

Reviews.

A SURVEY OF MEDICAL MISSIONS IN INDIA. 128 Pp., with map. 1929. Poona: National Christian Council, 1, Staveley Road. Price, Re. 1.

THIS report is one which should be read by every earnest student of medical matters and policy in India to-day. It has been prepared by the committee on survey, efficiency and co-operation of the Christian Medical Association of India, in conjunction with the National Christian Council of India, Burma, and Ceylon—largely as the result of replies to a questionnaire. And it contains a mass of information which we do not believe to be accessible elsewhere. The committee have certainly done their work extremely well.

Medical missionary work is inspired by the highest of ideals; yet the isolated worker may become so immersed in his own task that he may tend to lose sight of the general and national problem. The report emphasises both the special value and the special difficulties of medical mission work. In the first place it discusses the place of medical missions in general missionary work; there is no need to make out a case for this; the value of medical missions is recognised throughout India, and many of them are famous for their record of pioneer work in ophthalmology, surgery, tuberculosis, leprosy, and other branches of medicine. The map attached to the report shows how widely scattered are medical mission hospitals all over India; if this map recorded the activities of a Government department it would be a fine record; recording, as it does, the activities of missionary, voluntary agencies, it is a splendid record. "It is our conviction" records the Christian Medical Association of India "that the ministry of healing is an essential part of the work of the Christian Church." And Tables I and II give a summary of the hospitals and dispensaries for medical relief in India—both Government run and those run by medical missions; a study of these tables should afford any critic of "Western" medicine occasion for reflection, for it shows how immense is the problem of medical relief in this sub-continent, and how well it has been met.

In chapter 2 of the report the general situation with regard to medical relief in India is further outlined. This is an essay, almost, with a much wider appeal to medical readers than to only medical missionaries; it deals with the prevalent diseases of India, birth and death rates, the economics of the population, and the thorny question of non-qualified practitioners. In connection with the last problem, it is of interest to note that the more the practitioner of the indigenous systems uses "Europe drugs," the better his practice; the chief difference between him and the qualified man being that the latter has been taught how to use such drugs, whilst the former has not. The number of doctors per 100,000 of the population in different provinces is given, and varies from 2.8 in the Central Provinces to 21 in Bombay.

Medical aid for women is next considered. In this special field medical mission work finds its greatest scope for valuable service, owing to the purdah custom. The general history of the development of medical missions in India is then briefly outlined. Special hospitals, such as the mission sanatoria for tuberculosis and the hospitals of the Indian Mission to Lepers are next considered. Other chapters deal with the relation of the Christian Church in India to medical missions, mission medical schools, literature for medical propaganda, organisation, and statements of policy by medical mission boards at Home.

Chapter 4—conclusions—is that which will interest the general medical reader most. In the first place it is realised that medical missions in India are not sufficiently closely in touch with the general body of the Christian Church in India. Secondly, efficiency—although admirable in many of the better equipped and well-known medical mission hospitals—must be increased. A high degree of efficiency is usually reached on the surgical side, whilst—as our readers well know—tuberculosis and leprosy are subjects which medical missions in India have made especially their own. But the standards of laboratory and *x*-ray work especially call for improvement. The medical missions in India are too scattered and too little organised, and here the Christian Medical Association of India and the bi-monthly *Journal of Christian Medical Missions in India* constitute the nucleus for an all-India organisation which would improve matters considerably. The chief needs are more medical missionaries and more and better equipment. Extension is possible in almost every field.

The training of doctors, nurses, compounders and laboratory assistants is one of the most important services that medical missions are to-day rendering in India. At present medical men and women trained in such schools are eligible only for the Licentiateship and lower medical degrees, and the question of a Christian Medical College for India which would train for the university

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

M.B., B.S. standard has to be considered. The question of the safeguarding of Indian Christian women doctors and nurses after qualification is a difficult one, touched upon in the report. The demand for such skilled medical attendance is very great, yet naturally many medical missions hesitate to send out their graduates to places where they will be compelled to serve in male hospitals with no supervision or protection.

The chief problem of medical missions in India, perhaps, is the shortage of doctors and nursing sisters In all too many places a single doctor has to bear the whole burden, not only of running a large hospital single handed without being able to take leave, but of also facing financial difficulties and the ever-present difficulty of making ends meet. And the splendid self-sacrifice shown by many and many a worker in field only too often leads to a complete break-down in health; it seems essential that every mission hospital should have two or more doctors and two or more nursing sisters. Constant transfers of staff is another difficulty, which has perhaps been hardly sufficiently realised by mission boards at Home; for in medical missionary work—more than in almost any other field—it is personality that tells, and the success of a hospital may come to depend almost entirely on the personality of its head.

At present only about one mission hospital in thirteen in India is self-supporting. It should be more widely realised in India that the fees charged by a mission hospital go to that hospital in all instances, not to the individual doctor concerned. Yet too often the necessity laid upon the medical missionary by his Home board of rendering his hospital self-supporting means an intolerable strain.

Finally comes information as to where special training is to be had in the medical missions in India; at Miraj in general surgery and eye work; at Arogyvaram in Madras in pulmonary tuberculosis; at many different centres in ophthalmology, general surgery, obstetrics, and leprosy. A collection of useful appendices, including an account of the constitution and bye-laws of the Christian Medical Association of India, complete the report.

We would urge the non-missionary medical reader, as well as the medical missionary, to study this report, for it is comprehensive and covers a very wide field—essentially that of the general provision of medical relief (and especially of medical relief to women) throughout rural India. That medical missions in India are doing splendid work our readers must be fully aware; that better organisation and co-operation are called for is the lesson of this interesting and well-written report.

R. K.

THE FACTS OF MODERN MEDICINE.—By Francis W. Palfrey, M.D. London: D. Appleton and Co. 1929. Pp. XVI plus 490. Price, 21s. net.

This work forms one of a series of health books for the layman published by Messrs. Appleton & Co. The intelligent layman is frequently to be found engaged in the study of popular works on natural science. Satisfactory popular works on medicine have, however, been extremely uncommon until lately. Medical men have no doubt hesitated before writing such works which may have the effect of rendering the lay public unduly introspective. We congratulate Dr. Palfrey on the successful way in which he has avoided this difficulty, and has presented the main facts of medicine in a non-dramatic manner and in extremely simple language. The book opens with a general account of elementary biology. This is followed by a description of the elements of human anatomy and physiology. The subsequent chapters are devoted to an account of the diseases of the various systems. Treatment is discussed in general terms only, and the author wisely avoids reference to the use of special drugs. The paths of infection are clearly indicated, and the mode of action of vaccines and sera are explained. The author is extremely happy in his advice to laymen as to the correct attitude to be adopted towards the science and art of medicine and its practitioners, viz., as to what the public may reasonably expect from a medical man. The author has secured a real triumph in the exclusion of the less essential terms of medical terminology. We strongly recommend this work to the non-medical public.

R. B. L.

PERCUSSION OF THE CHEST.—By J. B. McDougall, M.D. (Glasg.), F.R.C.P. (Edin.), F.R.F.P.S. (Glasg.). London: H. K. Lewis and Co., Ltd. 1929. Pp. VIII plus 143 with 10 illustrations. Price, 6s. net.

Percussion is one of the daily methods of physical diagnosis. It may lack the glamour of some of our present-day laboratory devices, but that is in itself no reason why its possibilities should not be further explored. The author is to be congratulated for bringing forward this little handy book containing all the necessary information about the subject—historical, the technique of thoracic percussion, the acoustic aspects and variations in note in certain diseases of the chest. This book is to be recommended to medical students as well as to medical practitioners.

S. P. B.

THE EXAMINATION OF PATIENTS.—By Nellis B. Foster, M.D. 2nd Edition. Revised. London and Philadelphia: W. B. Saunders Company, Ltd. 1928. Pp. 392 with 83 illustrations, some of them in colours. Price, 21s. net.

Refinement of diagnosis compels the use of the trained senses of touch, sight and hearing. The development of laboratory methods has diverted attention from these fundamentals and the tendency now is to depend more on laboratory findings. Rarely can a laboratory test alone reveal the nature of disease. Usually it is a support to other evidence—a bit of data to be weighed in forming an opinion. While knowledge of any disease has been extended marvellously, yet the clinical features on which depend the differentiation of one disease from another are always relatively few in number. It is the ability to seize on those few relevant facts out of a mass of data that has always marked the true clinician. Diagnosis is a science and an art; a science in the method of using facts secured, an art largely in the mode of collecting the facts. This book is recommended as it presents in a clear and concise way the methods of determining the facts on which an accurate diagnosis is based.

S. P. B.

PRINCIPLES AND PRACTICE OF ELECTROCARDIOGRAPHY.—By C. J. Wiggers, M.D. St. Louis: The C. V. Mosby Company. 1929. Pp. 226 with 61 illustrations. Price, $7.50 net.

This book deals with a method of investigating the actual physiological and pathological responses of the heart. The electrocardiograph is still an instrument for the specialist only, but to him it is a valuable instrument, and this work does it full justice. The letterpress is clear and concise, and amply furnished with helpful diagrams. It is suitably indexed, and altogether is a well got up production. Dr. Wiggers, who has been one of the pioneers in this subject, is to be congratulated on a very successful book.

C. G. R. M.

PROBLEMS IN SURGERY. UNIVERSITY OF WASHINGTON GRADUATE MEDICAL LECTURES, 1927.—By George W. Crile, M.D. Edited by Amy F. Rowland. London and Philadelphia: W. B. Saunders Company, Ltd. Pp. 171. Illustrated. Price, 18s. net.

This is a small volume consisting of six post-graduate lectures. The title is a little misleading. Several of the lectures deal not so much with discussions on problems of surgery, but with Dr. Crile's solutions of these problems. The first deals with the management of acute infections and its interest lies largely in what is prohibited. Crile regards the following prohibitions of outstanding importance in acute infections, stimulants, vaccines, intravenous antiseptics, intravenous infusions, diathermy and ultra-violet light.

His lecture on "pre-malignant and malignant conditions" is full of interest and is especially remarkable for his success in extensive operations for carcinoma

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MEDICAL EVIDENCE

"All experience goes to show that Virol is a food of marked value in a great variety of conditions in which adequate nutrition by ordinary means is not easy to secure, including the general range of disease accompanied by wasting and Summer Diarrhœa."

British Medical Journal.

Virol is composed of marrow fat, glycerine extract of red bone marrow, eggs, salts of lime, iron, etc., malt extract, and the juice of fresh lemons blended in balanced proportion into an exceedingly fine and palatable emulsion, and prepared in such a manner as to retain unaltered the vital constituents of each of its components.

"The administration of Bone-Marrow in the form of Virol is attended by a distinct and progressive increase in the phagocytic power of the Leucocytes when tested against the Tubercle Bacillus due to a corresponding increase of opsonins in the sera examined. During the last eighteen months Virol has been used at the Sanatorium as a routine article of diet in all stages of Scarlet Fever and Diphtheria, during which period there has been a marked diminution of complications."

Medical Superintendent,
Monsall Fever Hospital,
MANCHESTER.

Virol has moreover a marked effect upon the conservation of the tissues, repairing waste, and restoring the equilibrium of a healthy metabolism. Its unequalled value as a repairer of tissue waste is of the utmost importance in bringing about a sound convalescence.

The addition of Virol to the diet is specially indicated in
ANÆMIA,
TUBERCULOSIS, FEVERS
and
GASTRIC DISORDERS.

VIROL

VIROL LIMITED, HANGER LANE, EALING, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

INFANT FEEDING ON SCIENTIFIC LINES

WHEN artificial feeding has to be adopted, either entirely or in part, the "Allenburys" Progressive System of Infant Feeding fully meets the case. The "Allenburys" Series of Foods is arranged on a true physiological basis; it provides a progressive dietary suited to the development of the infant, supplying at the appropriate times the stimuli that call forth, in a natural way, the secretion of the digestive enzymes.

The "ALLENBURYS" MILK FOOD No. 1 is adapted to the first three months of life. It is a scientifically balanced nutrient which when prepared for use, is similar to human milk in composition, physical properties and ready digestibility. *It contains no starch.*

The "ALLENBURYS" MILK FOOD No. 2 is used from the beginning of the fourth month to the end of the sixth month. It is similar to the No. 1 Food except that it contains a proportion of the soluble phosphates, albuminoids and sugars obtained by the digestive action of malt on whole wheat. *It contains no starch.*

The "ALLENBURYS" MALTED FOOD No. 3 is for use from the beginning of the seventh month. It consists of a carefully selected wheaten flour of a high albuminoid content. so treated as to render it easy of digestion, together with a proportion of the diastasic and nutritive constituents of malt. When prepared for use it contains no unaltered starch.

The "ALLENBURYS" MALTED RUSKS are made from special flours rich in protein and provide the infant's first solid food. As early as the fifth month these rusks may be used, a little at a time, to aid the cutting of the teeth. From about the tenth month they may be given as a staple article of diet in conjunction with the Malted Food No. 3.

The "Allenburys" Foods are designed particularly for Infant Feeding and are manufactured by special processes which make them peculiarly suited for this purpose. They are constant in composition and free from any pathogenic organisms.

A copy of our new publication "The 'Allenburys' Foods in Infant Feeding" will be sent post free on request.

ALLEN & HANBURYS LTD.
LONDON.

Special Representative for India:
A. H. P. JENNINGS, Block E, Clive Buildings, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of the larynx. His experience in cancer of the stomach is very much the same as that of Mr. Walton, e.g., only about 3 per cent. of cases operated on survive a five-year period. The third lecture on "operations on bad risk patients" is worthy of study by all surgeons who have to deal with this type of case. The fourth lecture on "the mechanism of hyperthyroidism" deals largely with the operation of thyroidectomy. As his experience is based on 17,759 operations on the thyroid, there must be few surgeons who are in a position to question his procedure. His present mortality is 0.8 per cent., and 94 per cent. of cases are definitely and permanently cured.

The fifth lecture is entitled "diagnostic and operative clinic" and is really a post-graduate discussion of the surgery of the gall-bladder, the relationship of cancer and ulcer of the stomach, cancer of the breast, and duodenal ileus as a factor in the causation of migraine.

The sixth and last lecture is an interesting speculation and discussion of the evidence supporting his theory that man is a bipolar electric mechanism.

The book is well printed and the illustrations up to the usual high standard of American textbooks.

A. H. P.

GENERAL SURGERY. Edited by Evarts A. Graham, A.B., M.D. (Practical Medical Series), 1928. Chicago: The Year Book Publishers. Pp. 800. Price not stated.

General Surgery published in the Practical Medicine Series gives a review of the advances in surgery that have been made during the previous year. Although it is published in America the work done in all other countries is given adequate recognition. We are pleased to find that reference is made to articles by Indian surgeons in several places.

The article on anæsthesia is of interest to surgeons in this country where in the great majority of hospitals chloroform still reigns supreme.

The anæsthetic preferences of American surgeons are set forth, based on 640 answers to a questionnaire.

Only one surgeon prefers chloroform and then only in average good risk laparotomies and cases of inguinal hernia.

Ether is by far the most popular anæsthetic, but a local anæsthetic is used in the majority of hernia operations and nitrous-oxide-ether in cases of poor risk laparotomies.

A very interesting article on "wound healing" includes the observations of L. H. Slocumb on the effects of chronic malarial infection during convalescence from operative procedures. The lighting up of the infection after operation, and the poor healing of the wound are described.

This has long been known to surgeons in India who take adequate precautions by means of quinine treatment. All recent advances and new opinions in surgery are discussed in the various sections.

The illustrations are good and there is a very complete index which in a book of this kind is invaluable. There is no doubt that every surgeon who wishes to keep abreast of the rapid advance in the methods and technique of his art should have this work in his possession.

H. H.

INJECTION TREATMENT OF INTERNAL HÆMORRHOIDS.—By M. C. Pruitt, M.D., L.R.C.P.S. (Edin.), F.R.C.S. (Edin.), F.A.C.S. (Edin.). St. Louis: The C. V. Mosby Company. 1929. Pp. 137. Illustrated. Price, $ 3.00.

This little book gives a very good description of the modern method of treating internal hæmorrhoids by injection.

The author is an enthusiast and certainly produces very effective arguments in favour of the injection method.

He gives a brief description of the surgical anatomy of the anal canal. The pathology of hæmorrhoids is clearly discussed and a very useful classification from the clinical point of view is also given. The chapters on diagnosis and more particularly the diagnosis of those cases suitable for injection are very good. The operative technique which is simple is adequately described and illustrated. The various solutions that have been used by different surgeons are enumerated.

A considerable part of the book is devoted to the history of the injection treatment. The change of opinion that has occurred since the method was first suggested is remarkable and now there can be no doubt that this is a popular and successful method of treatment. In India, as in every other country, the presence of hæmorrhoids is a common complaint.

That this complaint can be cured in very many cases by injection without an anæsthetic must appeal to all surgeons. This book should prove invaluable to those who have to deal with this condition.

H. H.

SQUINT: ITS CAUSES, PATHOLOGY AND TREATMENT.—By Claude Worth, F.R.C.S. 6th Edition. London: Baillière, Tindall and Cox. 1929. Pp. IX plus 246 with 42 figures in the text. Price, 10s. 6d. net.

This is the sixth edition of this valuable work which is a sufficient index of its popularity, and it is obvious that it has acquired a great reputation which hardly needs a review.

The first edition of the book was published in 1903 and there have been no fundamental changes in subsequent editions.

It is largely due to the author that the great advances in the cause, pathology and treatment of squint have been made in the last thirty years. The only treatment carried out by the greater proportion of ophthalmologists consisted in prescribing glasses, followed perhaps by a tenotomy which was sometimes combined with an uncertain advancement. No effort was made to train the fusion sense or the prevention of amblyopia.

The book deals in great detail with the whole question of squint. Chapters are devoted to binocular vision, convergent and divergent squint, amblyopia, the training of the fusion sense, the ætiology and investigation of squint, heterophorias and the treatment of squint.

For the operative treatment of squint the author is dogmatic in stating that advancement is the only satisfactory and safe operation. The operation of tenotomy of an ocular muscle should not be performed either alone or in combination with advancement of the opponent muscle. Operations which aim at elongation of the muscle without severance of its continuity are condemned as the effect is that of a complete tenotomy. Simple shortening of a muscle by resection of a part and reattachment to the old insertion is fairly satisfactory where only a very small angular effect is required, but is not advocated as, by the removal of a part of the muscle, the contractile power of the muscle and the range of rotation of the eye are lessened.

Muscle tucking is also not satisfactory for a similar reason, and has the added disadvantage that an ugly excrescence is produced which may never quite disappear.

Ophthalmology owes much to this author by whose teaching cases of unilateral squint in which treatment is commenced early and carried out by the methods described in his textbook are nearly all perfectly cured, having good vision in each eye and good binocular vision.

The book is a most admirable one, well illustrated and written in a clear simple style. It will prove most valuable to ophthalmologists in India where squint with its inevitable sequelæ is also so common.

E. O'G. K.

MEDICO-LEGAL PROBLEMS.—By Lord Riddell. London: H. K. Lewis and Company Ltd. 1929. Pp. 100 plus VIII. Price, 5s. net.

In this book the author has brought together his writings on the subject, which have been published from time to time in the *Transactions of the Medico-Legal Society*.

The book is divided into four chapters. In these the author has discussed from the ethical, legal, and medical standpoints the justifiability or otherwise of sterilization as a prophylactic measure for individual reasons, for the mentally unfit as a class, and questions relating to abortion and medical confidences.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In the matter of sterilization the author, after pointing out how the methods employed for this purpose may in certain circumstances amount to illegal maiming, goes on further to show how they may also stand irrevocably against the future wishes and welfare of the persons whose immediate purposes they are intended to serve. The medical practitioner should thoroughly familarize himself with these aspects of the question before entering upon an undertaking of this nature.

In the section on abortion the legal and ethical positions with respect to termination of pregnancy, when it is not only justifiable but is also a duty, are clearly discussed and the section of the book should be of great help to the young practitioner.

In the chapter on medical confidences, the legal position with regard to such confidences has been clearly set out. Proper weight is given to professional secrecy, which the author describes as a grave moral duty resting on the medical practitioner and points out that any gratuitous breach in this respect would render him liable to a claim for redress in a court of law.

The author's style is simple, clear, attractive and free from dogma. The understanding of the problems involved and their solution is materially helped by the incorporation of illustrative cases.

This book will be read with interest and profit not only by the young medical practitioner but also by all medical men.

J. C. D.

THE KAHN TEST: A PRACTICAL GUIDE.—By R. L. Kahn, M.S., Sc.D. London: Baillière, Tindall and Cox. 1928. Pp. XII plus 201 with 7 plates and 35 tables. Price, 18s. net.

Three years having elapsed since the publication of Dr. Kahn's previous work, *The Serum Diagnosis of Syphilis by Precipitation,* a considerable amount of data has been accumulated; and the author proposes to issue a second edition divided into three parts, of which the present publication forms the first part. The volume now published is an expanded account of the previous descriptions of the technical side of the test. It may be described as a laboratory manual of the Kahn test. The subject-matter, consisting almost entirely of detailed descriptions of technical processes, does not lend itself to a summary in a brief review. Dr. Kahn writes clearly, and his laboratory manual may be recommended to all engaged in the performance of his test.

R. B. L.

ARMY HEALTH IN INDIA, HYGIENE AND PATHOLOGY.—By Lieut.-Col. J. Mackenzie, M.A., M.B., Ch.B., D.P.H., R.A.M.C. Pp. 158 with several illustrations. London: John Bale, Sons & Danielsson, Ltd. 1929. Price, 10s. 6d.

This is a most admirable and important little book, which should be read by every officer in the military medical services in India. It deals with the bad old days, the present, and the future; whilst it will also be of considerable interest to the civilian practitioner. Practically speaking it is an essay on preventive medicine in the Army in India, and its most valuable feature is that the author has dug into the old records during his tenure as Director of Hygiene and Pathology at Army Headquarters, India, and gives his readers vivid accounts of the days of the East India Company and of the early days of the Army in India.

The consecutive chapters deal with the health of British troops in India, malaria, organization, research, cantonments, and conclusions. Sickness and mortality returns were first introduced into the British Army by Sir James McGrigor at the close of the Peninsular War in 1814, whilst in 1857 there was appointed a Royal Commission to investigate into the sanitary state of the troops in England. Army hygiene may be said to date from the time of appointment of this Commission. In 1859 a corresponding Royal Commission was appointed for India; this Commission, under the chairmanship of Lord Herbert, took four years over its labours, investigated almost every station in India, and drew up a voluminous and invaluable report. An amazing diagram constructed from this report shows the relative sickness and mortality at that time for (*i*) the healthy Army in England, and (*ii*) the sickly European Army in India. The comparison is a most striking one. In 1860 the admission rate for the British Army in India was 2,000 per 1,000 of strength, and the death rate 32.5 per 1,000; Mian Mir in 1861 returned the astounding mortality rate of 353 per 1,000—largely due to cholera; Amritsar in the same year gave a return of 124 per 1,000—largely due to malaria. Figures such as these are a positive revelation of what conditions used to be in the past, and one of the most valuable features of the book is its wealth of similar information. The official *List of Diseases* in 1868 will cause the reader to smile; we wonder what "enthetic diseases" were? In 1887 the P. M. O. Bengal actually prides himself on an admission rate of only 1,404 per 1,000 per annum. On p. 18 is a most instructive diagram showing how the admission rate for British troops has fallen from nearly 2,000 per mille in 1856 to under 600 per mille in 1925; these are the solid results of Army hygiene; they depict graphically what the medical services have accomplished for the Army in India. The lowest figure of all was reached in 1911 (just over 500 per mille from the graph), but subsequent to this the effect of the war becomes noticeable, and had not been completely recovered from—even in 1925.

The second chapter deals with malaria in the Army in India. Malaria is the Moloch of the tropics; it attacks some 50 million persons a year in India, and causes 1½ to 2 million deaths a year; neither plague, cholera, nor war can put up so terrible a record. Malaria dominates the returns for the British Army throughout the world. In 1837 the admissions for "fever" were 776 per 1,000 troops in Bengal and the deaths 14.4. The author then outlines very briefly the old views that used to prevail about the miasmatic origin of malaria, and there is here much most interesting writing, and many abstracts from old time reports. In 1898 malaria accounted for an admission rate of 2,000 per 1,000 strength in Fort Lahore, but by 1911—the healthiest year ever recorded for the British Army in India—the general rate for all-India had fallen to 90 per 1,000. That, again, is something of a record. "Detention" for malaria is one of the worst crimes that a military medical officer can commit; the patient should be "admitted" and thoroughly treated. There appear to be two cardinal remedies for malaria in the Army in India—"cold storage," and mosquito proofing. The former means the sending of units from malarious stations to the hills during the malaria season; the latter—hitherto far too much neglected in India—pays over and over again in improved health.

Chapter 3 deals with organization; "the hygiene and pathology services of the Army in India owe their inception, not to the gradual appreciation of the advantages of a health organization, but to the compelling force of thousands of dead British soldiers—dead of enteric fever in the eighties and ninties, and with a death rate increasing year by year in rapid crescendo to its climax in 1898"—a year in which the admission rate reached the astounding figure of 2,375 per 1,000 troops, and the death rate was 654. Surgeon-Major Davies was then appointed to carry out bacteriological analysis of water supplies, and, from that tiny beginning, there sprang into being the hygiene and pathology department of the Army, which is to-day rendering invaluable service, and which contributed notably to the success of the British and Indian Armies during the Great War. Surgeon-Major Davies should have a monument erected to him, for his services proved so valuable as the first bacteriologist to the Army in India that they were continued as such year in year out. The author gives a good account of the re-organization of the department in 1925 after the war, and present-day conditions. Plans of different military laboratories are given which show how vastly improved are present-day facilities on conditions which used to prevail twenty years ago.

Chapter 4 deals with research work. The primary function of a hygiene and pathology department is not research, but the control of disease; yet it is amazing how much the Royal Army Medical Corps has contributed to medical research in India. The *Journal of the Royal Army Medical Corps* was founded in 1903, and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

VITAMIN D in infant feeding

"When its mother's milk lacks Vitamins the infant suffers from marasmus–general feebleness"

Indian Medical Gazette, Feb., 1927

"..... The fact that Vitamin D deficiency appears to be largely responsible for marasmus in young infants and for rickets at a later period accords with some .... recent experiments."

From an article in a Leading Medical Journal, Jan. 1928

The richest milk in the world in Vitamins is New Zealand milk from which Glaxo is made

Glaxo

The Vitamin Milk-Food

Further information and literature gladly sent on request:
H. J. FOSTER & Co., Ltd., P.O. Box 202, BOMBAY

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TO REDUCE BLOOD PRESSURE

ANABOLIN

May be given orally or intramuscularly
Vial of 15 tablets; boxes of 6 ampoules
on prescription only
Through your usual Chemist

ANABOLIN (An-ab'-o-lin)

A residue extracted from the liver by fractional solvent methods which stimulates hepatic detoxication and reduces high blood pressure.

Literature and further information from the Endocrine Laboratory, Simla.

ENDOCRINES LIMITED.

WATFORD, HERTS, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

from that time to this there has been a continuous output of research papers of sterling merit.

Chapter 5 deals with cantonments, and here the early history of the growth of cantonments in India is outlined from 1711 onwards. Colonel Mackenzie's abstracts, which give a vivid account of camp life in the days of the East India Company and later, are intensely interesting reading. Between the years 1847 and 1856 100,000 men on the active list were reduced to 9,604; the effect of 20 years of service in India was to reduce 1,000 effectives to 96. A most instructive account follows as to the simply appalling state of military cantonments in the old days in India, with many quotations from ancient documents. It appears to have been a toss up whether one died of malaria, cholera, or dysentery; only the hardy survived.

To-day the average sick time per soldier is 7.6 days per annum in the British Army in England, and 11.7 days in the British Army in India. The difference is significant; but it is also significant of the immense reforms which have been brought about.

Chapter 6 records the author's summary and conclusions. Climate, *per se*, Colonel Mackenzie concludes, is *not* responsible for the morbidity and mortality of the Army in India. "Man, like every other form of life, perishes if his own waste products are not removed from his immediate vicinity. In England these waste products are removed; in India they are not." The health of British troops in India is on a lower level than that of the troops at Home owing to the prevalence of (*i*) certain tropical diseases, and (*ii*) venereal diseases. The so-called tropical diseases are largely insect-borne and can be prevented by the application of suitable measures. The excess of preventable disease in the Army in India, as compared with the Army in England, costs annually in hospital treatment a sum of approximately 57 lakhs of rupees (£400,000). Would it not be worth while to apply a fraction of this sum to the prevention of disease in the Army, rather than to its treatment? The greatest enemy which the British soldier has to face in times of peace is the biting insect which is transmitting tropical disease—malaria, sandfly fever, dengue; or even the non-biting fly which is transmitting bacillary or amœbic dysentery. That immense improvement has been effected in the past is no reason why still further marked improvements should not follow in the future.

* * * * * *

We have tried to present an analysis of this most attractive and interesting book. Its historical value is great; also its appeal to the military medical officer. It is succinct, well written, and should be read through, not once, but twice; in the first instance to gather a general impression of its lessons; in the second, to study the tremendous amount of statistical and detailed information which it contains.

R. K.

Annual Report.

REPORT OF THE EUROPEAN MENTAL HOSPITAL, RANCHI, FOR THE YEAR 1928. BY LIEUT.-COL. O. A. R. BERKELEY-HILL, M.A., D.M., I.M.S. RANCHI, SUPDT., GOVT. PRINTING, BIHAR AND ORISSA.

Colonel Berkeley-Hill's annual reports are always interesting documents, and the present one is no exception to the rule.

The available accommodation for the year was for 102 males and 96 females, a total of 198. The most notable change during the year was the discontinuance of the policy of strict segregation of the sexes. The "male" and "female" sections have accordingly been re-named "north" and "south" sections respectively, and wards in the north section re-named Maudsley, Conolly, Kraepelin, and Juan wards. In the south section also the wards have been re-named. The "borderline cottages" have now become simply the "cottages." Instead of different sections accommodating the two sexes, wards for males are now interspersed with wards for females in the same section.

There were 88 admissions during the year, including 19 re-admissions. The number of voluntary boarders was 31. Criminal insanes under treatment numbered 7. The patients come from every province in India—149 out of 280 of them from Bengal, and only 20 from Bihar and Orissa. The ratio of cures during the year was 14.83 per cent. whilst 19.44 per cent. are recorded as improved. The majority of cases cured are cured by short courses of treatment. The death-rate for the year was 4.6 per cent. Two misadventures occurred during the year, a case of suicide of a female patient—the second case only of suicide which has occurred since the hospital was first opened in 1918; and a fire in Conolly ward, due to a patient having set his bed alight. The general health was good.

During the year a vigorous campaign of propaganda in respect to mental hygiene and prophylaxis was pursued; also the Bengal Council of Women continued to inspect and report on the home conditions of discharged patients and to give them the very necessary advice and help.

No sort of seclusion or restraint is placed on the patients, with the exception of such measures necessary for the administration of hydrotherapy.

The chief types of mental disorder are in order of frequency secondary or terminal dementia, dementia præcox, imbecility, circular insanity, paranoia, confusional insanity, and others. An innovation during the year was the introduction of special "habit formation charts." In these the nature of the bad habit is recorded in the left hand column, and the measures most likely to cure it in the next column. In the last column the ward sister enters up the effect, if any, which the measures instituted have had on the bad habit. The occupational therapist also enters his remarks on the chart, and in this way several members of the staff are, so to speak, enrolled for an attack on a bad habit. The results so far have been very good.

Results with hydrotherapy continue to be most satisfactory. Two cases treated by psycho-analysis were discharged cured during the year; also two treated by prolonged sleep induced by Somnifen. The band continued to play its important rôle in providing musical treatment, musical drill, and choral and community singing. The cinema Colonel Berkeley-Hill considers to be of great therapeutic value. A travelling circus gave a performance, which most of the patients were permitted to attend. Evening promenade concerts were introduced on Mondays; at these the band plays and light refreshments are served. On May 17th, the tenth anniversary of the opening of the hospital, the patients and staff were "At Home" to visitors. Nearly 20 per cent. of the inmates take part in games, chiefly football, hockey, cricket, tennis, swimming and boating. Fourteen picnics were also held.

The occupational therapy building was completed and occupied during the year, thus supplying a much needed improvement. The garden was much improved during the year, and gives an excellent supply of fresh vegetables.

Receipts from all sources during the year amounted to Rs. 4,94,640, and expenditure to Rs. 4,28,711. The average cost per resident patient per annum works out at Rs. 2,193. Sister Marie Le Balche, the senior nursing sister on the staff, unfortunately contracted pneumonia, followed by a relapse after sea bathing at Puri, and was in a critical condition at the time when the report was written. One of the ward boys died of carbon monoxide poisoning from sleeping in a closed up room with a blazing charcoal brazier; whilst a second had a temporary attack of insanity. Otherwise the health of the staff was good. Lectures were given to the staff, who were also invited to write "research essays"; there is a regular weekly conference of the staff at which various matters are discussed. Visitors to the hospital during the year included Colonel Graham, I.M.S., Public Health Commissioner with the Government of India; also the delegation of the League of Nations. In this latter connection Dr. Yves Biraud, in a letter of thanks to the Medical Superintendent writes: "It was an education to us to see the methods which you use for the treatment of mental cases. Your occupational training and the absence of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

any physical restraint on your patients were considered by us to be of particular interest in view of the successes which you obtain thereby." M. and Mdme. Genis, the Consul-General for Belgium and his wife, visited the hospital in September. On their arrival the band played the Brabazon, and the Belgian flag was broken at the flagstaff.

In every respect an interesting and stimulating annual report.

Correspondence.

BLOOD PRESSURE IN INDIANS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Will you, or some of your readers, kindly inform me through the medium of your journal, as to the formula for finding *the normal systolic blood pressure in Indians?* According to European authorities, the normal systolic blood pressure is roughly 100 plus age in years, but Dr. A. C. Mozumdar of Calcutta in his book *Bedside Diagnosis* gives 90 plus half the age in years for Indians to be roughly the normal systolic blood pressure in Indians. Has any extensive series of observations been made on Indians; and on what experimental basis does Dr. Mozumdar's formula rest? Does it apply only to Bengalis, or does it hold good for residents in the United Provinces and Punjabis also?—Yours, etc.,

N. K. MUKERJEE, L.M.F.

223, REKABGUNJ, FYZABAD,
3rd August, 1929.

UNDESCENDED TESTIS AS A CAUSE OF PHYSICAL REJECTION.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I should be much obliged if any of your readers could give me advice as to whether a candidate for employment in the Police Department should, or should not, be rejected, on account of an undescended testis on one side.

Particulars of the case are as follows:—A Hindu male, aged 21, appeared before me for examination for admission to the Police Training School, Moradabad, on the 12th July, 1929. He was a well built youth, quite normal in other respects, but entirely devoid of a testis on the right side. The scrotum looked unilocular. No empty sac or space was felt in the right side of the scrotum. The left testis was normal, and did not appear to be over-developed. There was no impulse on coughing at the right external abdominal ring, which was of the same size as the ring on the left side. There was no swelling, pain, or tenderness in the right inguinal canal up to the internal ring, or in the right iliac region. The boy and his father both stated that the subject had had only one testicle since birth, and that this had caused him no trouble, though he had led an active life at school for several years.

I disqualified the candidate, as I did not like the risk of a possible strangulated hernia. He also had somewhat defective vision in the right eye.

What are the risks in such a condition, and should it be made a cause for rejection on physical grounds or not?—Yours, etc.,

RAMESHWAR SINGH, L.M.S.,
Officiating Civil Surgeon.

MUTTRA,
16th July, 1929.

KHAKI DRILL AND SKIN IRRITATION.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—The following facts may possibly be of interest to your readers and of use in cases similar to my own.

For several years I suffered from an irritating skin disease which, without pathological examination of scrapings, was diagnosed variously as "tinea" or "lichen." Various doctors prescribed various ointments —chrysarobin, benzoic, resorcin, salicylic, etc., etc., and iodine liniment, all of which were ineffectual. I had also a good deal of *X*-ray treatment, which was perhaps successful in certain parts, certainly unsuccessful in others. Early in the course of the affliction I noticed a close connection between it and sweating—it often recrudesced after violent exercise, especially in damp hot weather. Recently I noticed a recurrence after wearing khaki drill or twill clothing when I had been sweating very little or not at all, and I have accordingly made experiments which to my satisfaction establish the fact that the rash was caused by khaki not by sweating, for I have sweated profusely wearing other material than khaki, both rough and smooth, without a recurrence of the rash. My original belief that the sweating caused the rash is due to the fact that I generally wear khaki (as most people do in the East) when shooting or hill climbing or riding.

I shall be glad to answer any question you may care to put to me if my doing so would be of any use.—Yours, etc.,

H. WILKINSON, C.I.E., I.C.S.,
British Envoy at the Court of Nepal.

THE BRITISH LEGATION,
NEPAL,
22nd July, 1929.

(*Note.*—We are glad that Mr. Wilkinson has raised this point in our columns, for our own experience during the war was that khaki drill may be extremely irritant to some persons, though not to others. New-comers to India are frequently told to wear a cholera belt, and always to have flannel next to the skin. Anyone who has lived for several years in a hot and humid climate knows that such advice is nonsense. One should wear the lightest possible texture of clothing next to the skin; a very light cellular vest, perhaps, and a light twill shirt. We have shown Mr. Wilkinson's letter to Lieut.-Col. H. W. Acton, I.M.S., who is in charge of the Skin Clinic at the Calcutta School of Tropical Medicine. He remarks that there are two factors concerned in such cases: (*i*) the condition of the skin with regard to irritability, some persons being far more sensitive than others; and (*ii*) the texture of the cloth next to the skin. Many persons are quite unable to stand rough twills in contact with the skin.—EDITOR, *I. M. G.*)

VOMITING OF "BEES."

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—The following case history is perhaps sufficiently peculiar to warrant publication:—

A Brahmin female, aged about 18 years, had a severe attack of "hysteria," which subsided about the sixth day. A month later she complained of a feeling of "something in her throat" and vomited after her next meal. To the intense amazement of the onlookers the vomited material contained 15 or 16 "bees," which, after moving about sluggishly for some time, flew away. The next day she vomited charcoal; the day afterwards hair. On the fourth day some thirty identical insects were vomited. The insects are about half an inch in length, of a black colour, and are similar to those often found in cow-dung. It is clear that this patient is in the habit of swallowing earth, but the incident is so unique that I should be glad if any of your readers could throw any light on it.

I have kept some of the vomited material and the insects for examination.—Yours, etc.,

TINCORI SIRCAR, L.M.P.

DHAMDAHA,
PURNEA DISTRICT,
12th June, 1929.

(*Note.*—In reply to our request, Dr. Sircar was good enough to post to us the material which he had preserved, and this was submitted to Mr. M. O. T. Iyengar, Entomologist to the Public Health Department, Bengal. Mr. Iyengar reports that the insects are beetles belonging to the family *Tenebrionidæ*. Presumably they were swallowed in the larval state by the patient in earth containing them; not necessarily at the time of the attack

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Preparations

FOR THE USE OF

THE MEDICAL PROFESSION

LIQ. BISMUTHI "SCHACHT."

Absolutely pure and perfectly stable. The original preparation and the most physiologically active solution of Bismuth. Dose: One drachm, diluted.

PEPSINA LIQUIDA "SCHACHT."

A palatable, standardised solution of gastric juice from the pig. Useful in the treatment of dyspepsia. In ten-minim doses it gives excellent results in infantile diarrhœa. Adult dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO "SCHACHT."

Each fluid drachm contains in a concentrated form, besides the Pepsina Liquida, one fluid drachm of Liquor Bismuthi "Schacht." Dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO CO. "SCHACHT."

Contains one grain of Soluble Euonymin in each fluid drachm, in addition to the Pepsine and Bismuth. Dose: One drachm diluted.

BISEDIA.

A combination of Schacht's Liquor Bismuthi and Pepsina Liquida, with Morphia and Hydrocyanic Acid. Of the greatest value in the treatment of Acute Dyspepsia, Gastric Ulceration, Vomiting of Pregnancy, etc. Dose: Half to one drachm, diluted.

LIQ. CASCARÆ DULCIS "SCHACHT."

A palatable and very concentrated aromatic preparation of the finest Cascara Sagrada; free from bitterness and griping action. Dose: Quarter to one drachm.

LENIVA.

An excellent fruit laxative syrup, containing Alexandrian Senna, Figs, Prunes, Tamarinds, etc. Eminently suitable for delicate women and children. Dose: Half to two drachms according to age.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
BRISTOL, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TRADE MARK **'EPHETONIN'** BRAND

SYNTHETIC EPHEDRINE

$C_{10}H_{15}NOHCl$.

'EPHETONIN' is the hydrochloride of phenylmethylaminopropanol. **'EPHETONIN'** offers convenient oral administration in place of hypodermic injections of adrenalin in the treatment of

Bronchial Asthma
Respiratory Paralysis
Hay Fever
Hypotonia etc.

The action of "Ephetonin" is analogous to that of Adrenalin, but it is superior to this by reason of its more prolonged effect, its low toxicity, its effective absorption from the intestinal tract, the absence of habit formation and its stability in solution.

It is distinguished by

Therapeutic Potency **Low Toxicity**
Oral Administration **Constant Effect**

Unlike Adrenalin, it may be given not only subcutaneously but by the mouth. Solutions may be sterilised by heating.

DOSAGE: Commence with half a tablet, or $^1/_4$ gr. powder, twice or thrice daily, increasing the dose as required up to a maximum of a whole tablet, or $^1/_2$ gr. powder, three times a day.

PACKING: Bottles containing 25 tablets ($^1/_2$ gr.)
Bottles containing $^1/_2$ oz. powder
Boxes containing 6 × $^1/_2$ gr. 1 c.c. ampoules

E. MERCK CHEMICAL WORKS DARMSTADT (GERMANY)

Represented by Messrs. MARTIN & HARRIS Ltd., CALCUTTA, BOMBAY, MADRAS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of hysteria, but later; possibly on two or more occasions. EDITOR, *I. M. G.*)

A SUGGESTED MEASURE IN THE CONTROL OF PLAGUE.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Plague is a disease which involves three hosts; man, the rat, and the rat flea. At present our attempts at control of the disease are directed towards exterminating rats, removing man from the infected areas, and inoculating him against the disease. The proposal to house large populations in rat-proof houses is impracticable, whilst one cannot inoculate every person exposed to infection. The rat is an almost domesticated animal, and its numbers depend on the food supply.

Now Rowland's experimental studies have shown that rats which recover from plague have a certain degree of immunity which lasts for some months. Inoculation with anti-plague vaccine confers an immunity in man which lasts for about six months; the same measure also protects rats for several months.

Our anti-rat measures during an epidemic may destroy many immunised rats. Would it not be possible, instead, to introduce into infected areas large numbers of rats (preferably males only) immunised against plague by anti-plague vaccine? One would suggest that three rats per head of population be used in the infected area, and also that such immunised rats be introduced into the villages surrounding the infected area. These would pick up the rat fleas that have left infected rats, and the antibodies in the blood of the immunised rats might even reduce the multiplication of plague bacilli in the infected fleas.

This suggested measure might at least be tried out experimentally on a small scale. If infected fleas, feeding on immune rats, gradually become free of their infection, such a measure might become a most important one in the eradication of plague.—Yours, etc.,

ACCACIO DA GAMA, D.P.H.,
Assistant Director of Public Health,
C. R. D., Sind.

KARACHI,
25th July, 1929.

(*Note.*—We have only published an abstract of Dr. da Gama's letter, as the original is rather too long for publication. We believe that a considerable volume of observations was accumulated on this subject by the Plague Commission. But is the suggestion to introduce very large numbers of inoculated rats into an infected area a practicable one?—EDITOR, *I. M. G.*)

Service Notes.

APPOINTMENTS AND TRANSFERS.

LIEUTENANT-COLONEL W. M. HOUSTON, I.M.S., Port Health Officer, Bombay, is appointed Inspector-General of Civil Hospitals, Bihar and Orissa, with effect from the afternoon of 6th August, 1929.

On return from leave Lieutenant-Colonel D. P. Goil, I.M.S., has been appointed as Civil Surgeon, Howrah, with effect from the 3rd August, 1929.

The services of Major W. J. Webster, M.C., I.M.S., an officer of the Medical Research Department, are placed temporarily at the disposal of the Government of Bombay for employment as Officiating Assistant Director, Haffkine Institute, Bombay, with effect from the 1st August, 1929, or subsequent date on which he assumes charge of the duties of the appointment.

The services of Major J. B. Vaidya, I.M.S., are placed temporarily at the disposal of the Government of Assam, with effect from the date on which he assumed charge of his civil duties in that province.

Major J. L. Sen, M.C., M.B., I.M.S., Civil Surgeon in Assam, is appointed to act as Superintendent, *X*-Ray Institute, Dehra-Dun, *vice* Major S. M. Hepworth, granted leave, with effect from the 5th August, 1929, and until further orders.

The services of Major E. C. A. Smith, I.M.S., are placed permanently at the disposal of the Government of Bombay for employment as an alienist.

The services of Major H. C. Alexander, I.M.S., are placed at the disposal of the Government of Bihar and Orissa, with effect from the 1st July, 1929.

PROMOTIONS.

Majors to be Lieutenant-Colonels.

R. F. D. MacGregor, M.C., M.B. Dated 29th July, 1929.
A. L. Sheppard, M.B., F.R.C.S.E. Dated 29th July, 1929.
P. K. Gilroy, M.C., M.D., F.R.C.S. Dated 29th July, 1929.
J. A. A. Kunahan. Dated 29th July, 1929.
M. L. C. Irvine, M.D. Dated 29th July, 1929.
E. W. O'G. Kirwan, M.B., F.R.C.S.I. Dated 29th July, 1929.
G. L. Duncan, M.B. Dated 29th July, 1929.

Captains to be Majors.

S. L. Patney, M.B. Dated 2nd August, 1929.
D. N. Bhaduri. Dated 4th August, 1929.
R. G. Dani, M.B. Dated 4th August, 1929.
P. F. A. Grant, O.B.E., M.B. Dated 9th August, 1929.
C. S. V. Ramanan. Dated 19th August, 1929.
K. R. K. Iyengar, M.D. Dated 5th July, 1929.
M. Prasad, M.B. Dated 5th July, 1929.
G. C. Maitra. Dated 14th July, 1929.
J. J. Rooney, M.B. Dated 22nd July, 1929.
Bodh Raj Chaudhri. Dated 22nd March, 1929.

The provisional promotion of the undermentioned officers to the rank of Captain as previously notified by the Army Department, is confirmed, subject to His Majesty's approval:—

G. S. Chawla, M.B.
T. A. Malone.
W. Scott, M.B.
B. S. Nat, M.B., F.R.C.S.
V. A. Edge.

LEAVE.

Lieutenant-Colonel E. C. Hepper, I.M.S., Civil Surgeon, Bareilly, is granted leave for 12 months, with effect from 1st May, 1929, or date of availing.

Major S. M. Hepworth, M.B., I.M.S., Acting Superintendent, *X*-Ray Institute, Dehra-Dun, is granted, preparatory to retirement, leave on average pay for 1 month and 2 days combined with furlough on private affairs for 1 year under military rules, with effect from the 5th August, 1929.

Major S. S. Sokhey, M.D., D.T.M. & H., I.M.S., Officiating Director, Haffkine Institute, Bombay, is granted leave for 4 months out of India, with effect from the 3rd August, 1929.

Major Jelal M. Shah, M.B.E., I.M.S., is granted, with effect from 3rd October, 1929, or subsequent date of availing combined leave for 16 months.

NOTES.

"BOOTS, CASH CHEMISTS."

"BOOTS, CASH CHEMISTS" is a household word in the United Kingdom, and it will interest our readers to know that this very well-known firm—Messrs. Boots' Pure Drug Co. of Nottingham—have recently opened their own depôt at Mercantile Buildings, 10, Lall Bazar, Calcutta. Such special preparations as their Stabilarsan, gonococcal vaccines, liver extract and insulin are here kept in cold storage under ideal conditions. The resident

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

representative is Mr. Ralph Paxton, at the above address, from whom information and literature may be obtained.

BRITISH MEDICAL ASSOCIATION MEETING AT MANCHESTER, 1929.

As a means of collating a quantity of information and presenting it in an attractive form and in a limited space, it would perhaps be hard to improve upon the system adopted by Burroughs Wellcome & Co.

A most striking feature of this firm's exhibit was the revolving illuminated structure adopted to display the sources of eight typical medicaments of vegetable origin used in the production of notable "Tabloid" and associated products. These hand-paintings possess an intrinsic beauty of their own and would claim attention on this score, apart from any professional interest. To the practitioner, however, the display must also bring back memories of his youthful interest in botany and remind him of the many processes—some tedious, some interesting, some extremely difficult—to which the raw material harvested from woodlands and fields or from cultivated herb gardens must be submitted before reaching his patient.

The Ephedra hand-painting proved of particular interest, partly because natural ephedrine is the medicament of the moment in the treatment of asthma, hay-fever, and other engorged conditions of the naso-pharynx, and partly because the plant itself is not at all familiar even to students of botany. There is, indeed, reason to believe that the illuminated reproduction of *Ephedra sinica* on the Burroughs Wellcome & Co. exhibit afforded to many visitors their first opportunity of studying this interesting plant at close quarters.

In a similar illuminated octagonal exhibit, the sources of eight typical medicinal substances of animal origin were shown in association with "Tabloid" products prepared from them. This original yet simple method of presenting a coherent view of the essentials of modern organo-therapy aroused considerable interest and provided many already acquainted with the subject from the clinical standpoint with much condensed information of a practical sort.

The causative organisms of certain specific diseases were shown as illuminated coloured photo-micrographs. Associated with these were products used in the diagnosis, prophylaxis and treatment of the diseases concerned.

Some indication of the part played by "Tabloid" medical equipments in exploration, travel, warfare and aviation was obtained from the display of the actual "Tabloid" outfits distinguished by association with famous explorers. The equipments used by Stanley, Peary, Scott and the Mount Everest Expedition were shown and also many standard cases which, though not destined to be so severely tried, seemed to hold the same promise of utility in emergencies. Dioramic displays of the critical events in the story of the expeditions were shown and provided striking evidence of the exacting conditions successfully encountered by the "Tabloid" Medical Equipments.

An illuminated chart demonstrated the relative values of different brands of malt extract. It showed the result of an independent examination by the Inland Revenue Department, Ottawa, Canada, of 152 specimens of malt extract. Only 10 of the 152 samples proved satisfactory malt extracts in every respect. Of these ten, no fewer than seven were "Kepler" Malt Extract, and all the specimens of this extract examined by the Government Analyst were approved by him.

APPARATUS FOR RADIOLOGY.

We have recently received from Messrs. Newton & Wright, Ltd., 471-473, Hornsey Road, London, N. 19, a copy of their brochure No. A|29, which gives a list of their high tension transformer units, which will be of considerable interest to radiologists in India. The Simplex Unit, depending upon the self-rectification of a hot cathode tube, and restricted to an output of 30 milli-amperes as a maximum, is the simplest apparatus listed. It is adapted to either direct or alternating current. Their Snook machines, both the junior model and the standard model, are very well known; the former suitable for private practice, the latter for heavy work in a large hospital. The super-tension Snook model is intended for those radiologists who require an apparatus for therapy up to a fairly high tension, as well as for radiography.

The development of the thermionic valve has altered radiographical work of recent years, and in this connection the Mono-Valve and Tetra-Valve outfits manufactured by the firm are of interest.

The different equipments issued by the firm comply, as far as possible, with the recommendations laid down by the X-ray and Radium Protection Committee; and all apparatus is tested before despatch and is accompanied by a twelve months' guarantee.

"INFECTED WOUND THERAPY."

Under the above title, the Denver Chemical Manufacturing Co., 163, Varick Street, New York, have issued a brochure dealing with the use of their well-known product "Antiphlogistine" in such conditions. Recent investigations show that glycerine is not only an ideal antiseptic, but also a germicide, capable of penetrating the tissues, of stimulating local leucocytosis and tissue repair. Antiphlogistine is stated to contain 45 per cent. of glycerine on analysis, and combines the virtues of glycerine, plus sustained heat and moisture and the mechanical protection afforded by the aluminium silicate base of the preparation. It is both powerfully hygroscopic and bacteriostatic, and also quite non-irritant. Any medical man who has had much experience of the preparation will not hesitate to vouch for its vastly better results than with the old-fashioned fomentation.

A copy of the brochure will be sent to any medical man upon application to the Denver Chemical Manufacturing Co.

Publishers' Notice.

Scientific Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to The Editor, *The Indian Medical Gazette*, c|o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers, relating to Subscriptions, Advertisements, and Reprints should be addressed to The Publishers, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India, Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

"KATAPHYLAXIA," A PHENOMENON SEEN CLINICALLY IN FILARIASIS.

By H. W. ACTON,
LIEUTENANT-COLONEL, I.M.S.,
Director and Professor of Pathology and Bacteriology.
and
S. SUNDAR RAO, L.M.P.,
Darbhanga Research Scholar, Filariasis Enquiry, Calcutta School of Tropical Medicine and Hygiene.

Introduction.

THE term anaphylaxia or allergy is used for a phenomenon characterised by generalised hypersensitiveness of certain mesoblastic cells, and is produced by a leakage of certain protein poisons into the circulation. On the other hand, the term kataphylaxia is employed when there is only a localised failure of the tissue-defence mechanism, without involvement of the similar tissues in other parts of the body. In 1911-1912 the senior author had the privilege of seeing Sir David Semple's original experiments, which demonstrated the existence of this latter phenomenon. Semple first injected washed spores of the tetanus bacillus into the muscles of rabbits and guinea-pigs, and then, some days or weeks later, gave quinine subcutaneously, but at a different site. The animals developed tetanus and died as a result of the quinine injections. Semple (1911) explained these results as follows; washed tetanus spores, free from toxin, do not produce tetanus, and leucocytes normally remove such injected spores by degrees from the site of injection; the injection of quinine, however, produces a localised area of necrosis at the site of injection, the leucocytes carry the spores to this area, and—as the tissues are dead and therefore deprived of oxygen—this dead tissue forms a suitable nidus in which the spores develop into bacilli; these bacilli multiply rapidly, produce toxins, and therefore cause tetanus.

Gye and Cramer (1929) have shown that the same phenomenon holds good in their experiments on the *Vibrio septique*, and for the closely allied organism of gas gangrene. They first injected washed spores of these organisms into the tissues, and six months later injected calcium salts into the tissues; this produced gas gangrene. Gye and Kettle (1922) found that mice became more susceptible to infections with the bacillus of tuberculosis after injections of solutions of silicic and ortho-silicic acid; this susceptibility was both localised as well as generalised in these animals. During the course of some research work on tuberculosis in Indian cattle with Taylor (1917) Acton noted that, although the incidence of tuberculosis in Indian cattle is rare—only some 4 per cent.—yet the infection was always localised to the bronchial glands, and occurred particularly in those glands which had been irritated by fine particles of flint, etc. Many of these animals had enlarged glands which were not tuberculous, but which when sectioned showed numerous endothelial cells replacing the lymphoid tissue, and amongst these cells were particles of flint that had been inhaled by the animal whilst feeding, and had found their way into the glands—a condition of silicosis of the lymphatic glands. The tuberculous nodules with acid-fast bacilli in them were almost invariably found in these enlarged silicosed glands. Cramer (1924), and in the same year Cramer and Kingsbury (1924) showed that in animals fed on a diet deficient in vitamines the mucus secreting cells of the intestine lose their protective power and allow bacteria to invade the deeper tissues. Acton and Chopra (1925) showed that in epidemic dropsy the same phenomenon was present, as intestinal bacteria were found to invade the tissues. They showed that various fæcal streptococci and bacilli of intestinal origin could be obtained from the urine by catheterisation in such cases. Dr. K. P. Banerjee (1927), Assistant Professor of Pathology at the Calcutta School of Tropical Medicine, worked out an improved technique for the cultivation of such organisms in the urine. This method has given us much valuable information in studying the phenomenon of kataphylaxia in filariasis, and in allied problems. Acton and Chopra considered that epidemic dropsy was caused by certain toxins produced as the result of decomposition set up in damp rice during the monsoon months, and that it is not due to avitaminosis. This toxin acts on the mucous membrane of the bowel as is shown by the diarrhœa associated with the disease, and this breaks down the local defence-mechanism of the columnar epithelium of the intestine, allowing intestinal bacteria to invade the tissues and produce fever. The recovery of such intestinal organisms from the urine is evidence that they have invaded the body system from the gut. The work of Besredka (1925) on bilivaccin has shown that the local defence-mechanism of the intestinal mucosa can be stimulated against such pathogenic bacteria as typhoid and dysentery bacilli.

The phenomenon of kataphylaxia is worthy of much more study than has at present been given to it. It is a much less dramatic phenomenon than anaphylaxia, but it is more important. An investigation into the causes of this failure of the local defence-mechanism shows that it is more widespread and more subtle than is the phenomenon of anaphylaxia, since it involves all the tissues derived from the epiblast, hypoblast, and mesoblast. The epiblast and hypoblast are concerned with the protection of the mesoblast from surface invasion by bacilli from the skin or the gut. As far as we are aware, only two of these tissues have been studied, the mesoblast and hypoblast.

(*i*) *Epiblastic Kataphylaxia.*—The senior author of this paper hopes to deal with this subject in a later memoir. Here, however, we may make a few remarks to make our description of this condition clearer. The surface layers of the epidermis of the fœtus *in utero* do not undergo keratinisation, but contain certain waxy substances which form a waterproof coating, and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The occurrence of allergic or toxic symptoms and signs in filariasis. We have very rarely seen such signs and symptoms in persons suffering from filariasis with complete lymphatic obstruction, in whom no microfilariæ could be found in the peripheral blood. But in persons in whom such microfilariæ have been found we have frequently observed signs of intoxication, or allergy. Thus attacks of urticaria are quite common among them; the rash may persist for a few weeks or months, occurring nightly; or it may be periodic, seen only once a week or every ten days, or occurring with lunar periodicity every fourth week or so. Such patients always show microfilariæ in their peripheral blood at nights, and their eosinophile leucocyte count is usually over 6 per cent. They do not react to the ordinary food sensitiveness tests, nor respond to the methods usually employed in the treatment of urticaria by endocrine therapy. Arsenical compounds, such as soamin, or polyvalent vaccines made from the various strains of streptococci or staphylococci or both together, give the best result in the treatment of such filarial urticarias. In such treatment what is carried out is probably either a general increase of body resistance, or a diminution of the general sensitiveness of the body tissues, but one cannot predict whether soamin or autogenous vaccines will be the more successful. Sometimes we have observed periodic attacks of non-suppurative lymphangitis in the breast, arms, or legs around aberrant migrating filariæ, when they are near the skin surface. Although such cases occur, they are not very common, since the worm is not usually near the skin surface. At such times these filarial carriers may suffer from periodic headaches or migraine, or a slight rise of temperature, which Forman and Pitale (1928) consider are due to the action of the toxin.

We shall discuss in greater detail later on the lesions produced in the tissues by the filariæ; it will be seen that they are very similar to those produced by *Filaria medinensis,* except that *Filaria bancrofti* always lives in the lymphatics, whereas *Filaria medinensis* can burrow her way through the tissues. The irritation of the tissues is seen from the earliest stage onwards of invasion of the subcutaneous tissue by the embryos injected by the mosquito. In an experimental infection we found that the skin in the region where the developing filariæ had penetrated became thickened and red, and this condition persisted for some days. Three months later a transient patch of lymphangitis appeared on the outer surface of the arm, and so far no microfilariæ have been found in the blood at night.

The lymphatic vessels and glands all show signs of irritation, due to the action of some toxin in the worm, and they respond by hypertrophy of the endothelial cells of the vessel walls or of the gland tissue to produce a granulation tissue which contains a large number of eosinophile cells. When obstruction has taken place in the lymphatic glands or vessels, aberrant migration of the filariæ may occur, so that when they approach the skin surface patches of hyperæmia or œdema (peri-lymphangitis) are seen, similar to those observed in cases of guinea-worm infection as the adult worms are coming to the surface.

This evidence strongly suggests that *Filaria bancrofti* produces a toxin which enters the blood stream and causes an eosinophile response from the bone marrow, similar to that produced by the toxins of other animal proteins.

The nature of the lesions caused by the toxin.

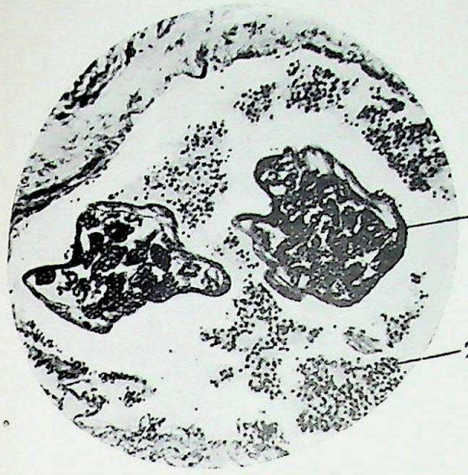
In filariasis there are two kinds of toxins—helminthic and bacterial—that act on the tissues, producing lesions which merge into one another, but which can usually be differentiated from one another. The filarial lesions can be distinguished by two points, first the chronicity of the lesions, and secondly, the nature of the cellular response made by the tissues against this toxin. The endothelial cells of the lymphatics or the reticulo-endothelial tissue of the lymph glands hypertrophies and eosinophile cells migrate into this area. This eosinophile granulation tissue is the response of the tissues against the filarial toxin. On the other hand, there are more acute and more diffuse lesions, when the tissues respond to the bacterial infection. The vessels in the neighbourhood dilate, lymph is poured out into the tissues (inflammatory œdema), and numerous polymorphonuclear leucocytes invade the area. These inflammatory lesions are caused by staphylococci or streptococci; in the case of the former organisms the infection may go on to suppuration (filarial abscess), and in the case of the latter organisms a typical inflammatory lymphangitis or cellulitis is seen clinically. A study of the microscopical sections of these lesions readily gives us the information as to whether the helminthic or the bacterial toxin has played the predominant rôle in the production of a particular lymphatic obstruction.

For the present, we will not discuss the effect of the bacterial toxins, but will only consider the effects produced on the tissues by the filarial toxin. The immature filariæ in the proboscis of the mosquito are deposited on the skin surface, burrow their way through the epidermis and reach the superficial villous lymphatic terminals in the papillæ. In their passage upwards along the lymphatics they are compelled to pass through the main intercepting lymphatic glands that are placed along the course of these vessels. Many of these immature filariæ are caught in the reticulo-endothelial tissue of these glands and there destroyed; this is illustrated in Plate II, fig. 4. The filariæ that succeed in passing through these glands reach the main lymphatic trunks of the arm, leg, or abdomen. When they reach maturity and the female commences to lay her embryos the microfilariæ find their way into the blood stream, *via* the thoracic duct.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

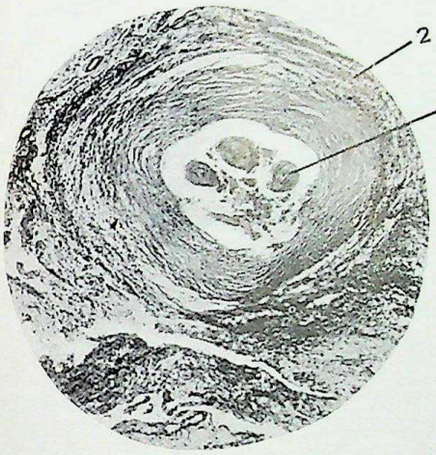
PLATE I.



Plug of cells. 1
F. bancrofti. ♀
2 Desquamated cells.

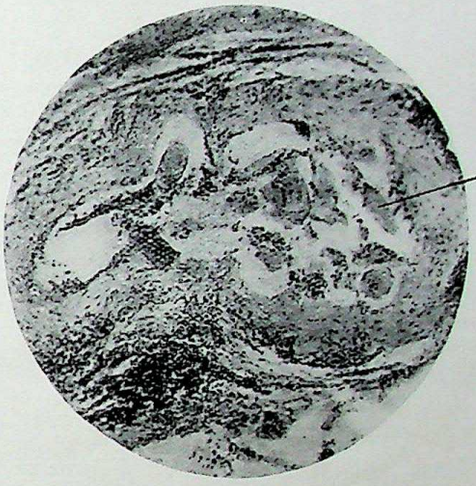
Fig. 1.—Section of lymphatic gland showing females with coiled embryos in the uteri and desquamated endothelial cells around the worms.

Fig. 2.—Same as Fig. 1. Showing a plug of cells at the head end of the worm.



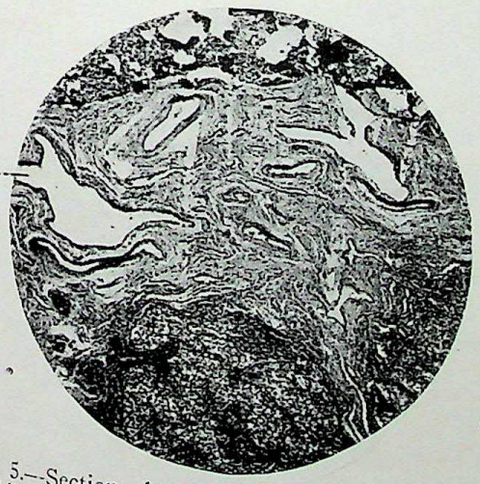
2 Thickened lymphatic.
1 Immature *F. bancrofti.*

Fig. 3.—Lymphatic gland with immature filariæ.



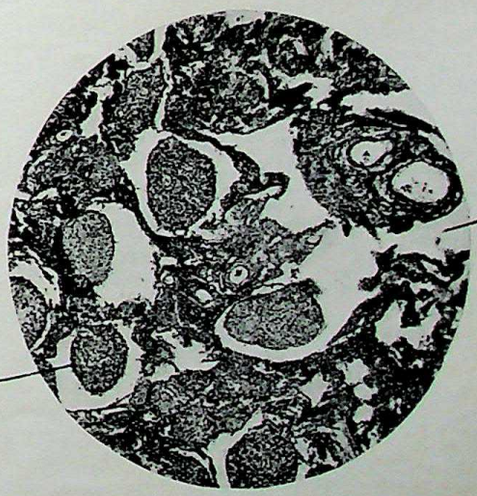
1 Immature *F. bancrofti.*

Fig. 4.—Immature filaria being absorbed in a small dilated vessel in the hilum of a lymphatic gland.



Lymph-varix. 1

Fig. 5.—Section showing the dilated lymphatics at the hilum of a lymphatic gland due to obstruction of the efferent vessels going to the gland above.



1 Dilated lymphatic
2 Granulomatous mass.

Fig. 6.—Section showing granulomatous masses which project into the lumen like papillomatous growth.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PLATE II.

Fig. 1.—Hæmatoma of the spermatic cord.

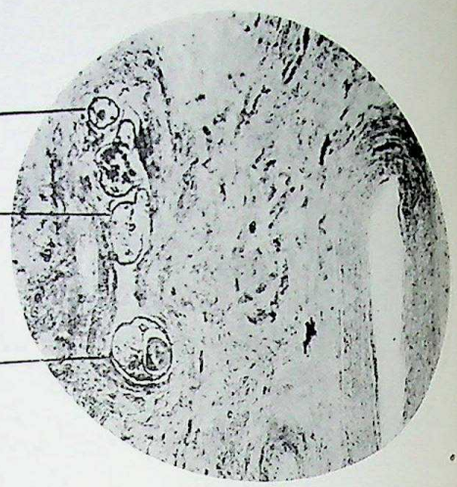


Fig. 2.—Section of a gland showing the tail ends of four worms. Note the amount of irritation is much less here compared with Plate I, fig. 1.

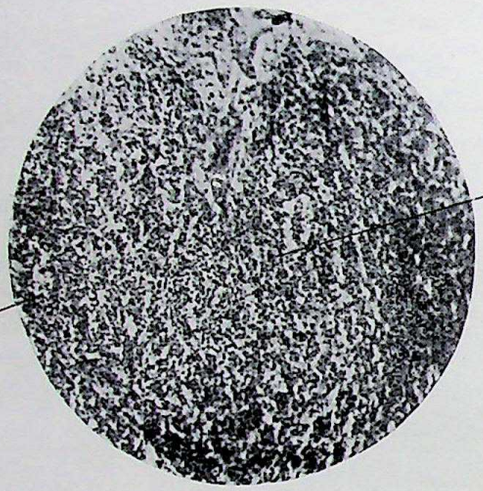


Fig. 3.—Irritation of the reticulo-endothelial tissue of lymphatic gland.

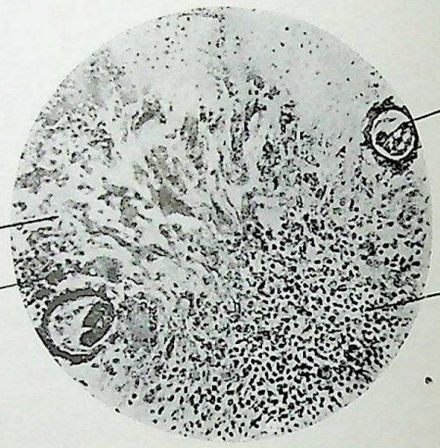


Fig. 4.—Section of a lymphatic gland. *F. bancrofti* being destroyed by giant cells.

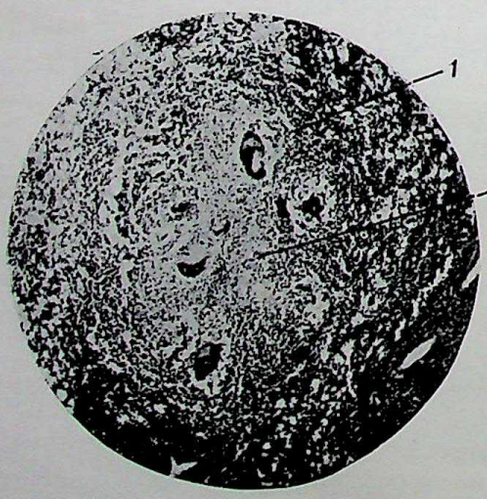


Fig. 5.—Formation of a scar in the substance of a gland as a result of destruction of the worm.

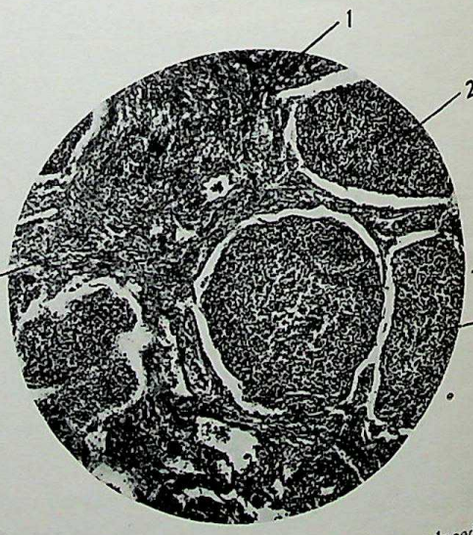


Fig. 6.—Lymphoid tissue gradually replaced by fibrous tissue.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

We will therefore first consider *the action of the filarial toxin on the main lymphatic trunks.* This effect is best seen at the site where mature females are found and where they are obviously laying their embryos. Plate I, fig. 1 shows sections of two adult females; the uterus of each is full of coiled embryos and the lumen of the lymphatic contains a large number of desquamated endothelial cells derived from its endothelial lining. As the vulval orifice of the worm is situated close to its head end, the main action of the toxin which is expelled at the time when the embryos are shed is on the wall of the vessel, and is seen to be most marked near the head end of the filaria. Thus in Plate II, fig. 2, which is a section near the tail ends of four worms the same amount of irritation is not seen in the lymphatic as in the case of Plate I, fig. 1. At the head end of the worm a plug of cells is usually formed (Plate I, fig. 2) consisting of cells derived from the vessel wall as the result of desquamation of the endothelial lining. In this way an obstruction is formed against the centripetal flow of the lymph and the pressure rises in the obstructed lymph channels. The gravid female probably lays the embryos intermittently for a few days in each month, and this is the most likely explanation of the lunar periodicity of febrile attacks and other symptoms, which patients are so emphatic about when explaining their case. When the gravid female has ceased to lay embryos, toxins are no longer excreted to the same extent as during fecundation, and for the time being the inflammation subsides. This intermittent rise in the lymph pressure is the first factor in the mechanical production of the lymph-varices which are of filarial origin. These repeated attacks of inflammation weaken the wall of the lymphatic, and with the rise in lymphatic pressure the vessel wall dilates; thus Plate I, fig. 5 shows the dilated lymphatic channels at the hilum of a lymphatic gland due to obstruction of the efferent vessels going to the gland above.

The intermittent rises in pressure, associated with weakening of the vessel wall—particularly in those lymphatics supported by loose tissue—cause them to dilate and become tortuous like varicose veins, the condition known as lymphatic-varix. Clinically such varices are seen most frequently in the spermatic cord, around the superficial inguinal glands, on the inner aspect of the arm, etc. The repeated entrance of more mature or adult filariæ into these dilated, tortuous lymphatics keeps up the irritation of the vessel wall, so that the endothelial cells hypertrophy and come to form a granulomatous mass which projects into the lumen like a papillomatous growth (Plate I, fig. 6). The slightest traumatic injury to these granulomatous growths ruptures them and bleeding occurs into the lymph vessel, and clotting of the blood does not take place unless the hæmorrhage is severe, as in the case in hæmato-chyluria, or if the rise in pressure is great enough to control the bleeding, as in hæmatoma of the spermatic cord. Plate II, fig. 1 shows such a hæmatoma of the spermatic cord, and Plate I, fig. 6 shows the condition of lymphatic varix outside the area of the hæmatoma.

As long as the lymphatic obstruction is only partial or intermittent, microfilariæ will be found in the blood stream at night. Hence it is the rule that in cases of *chyluria and lymphatic varix of the cord* microfilariæ are practically always found in the blood. On the other hand, the lymphatic obstruction may become permanent, and if the lymphatics are sufficiently large in calibre, filariæ will come into them, mature, and commence to lay embryos. Each time that embryos are ejected the toxin ejected at the same time will cause desquamation and hypertrophy of the endothelium, and after recovery the endothelial cells will form fibrils which will thicken the wall of the vessels until the lymphatic vessel looks more like a vein than a lymphatic, and the lumen is gradually diminished in size. Plate I, fig. 3 shows such a lymphatic containing three immature filariæ. Sometimes the obstruction above is so marked that many of the main lymphatics are thickened and sclerosed, so that the immature filariæ are unable to find lymphatic channels sufficiently large in diameter to allow them to pass through and reach maturity, and are forced to remain in the smaller lymphatics. Here they die and are absorbed *in situ*, partly as the result of phagocytosis by the giant cells, partly by the effect of cytolysins produced by the endothelial cells. Plate I, fig. 4 shows such an immature filaria being absorbed in a small dilated vessel in the hilum of a lymphatic gland. The fact that many filariæ die in the small vessels and thus never reach maturity provides a second reason to explain why microfilariæ are so rarely found in the peripheral blood when obstruction is complete.

The next point to investigate is the reason why the adult female filaria selects certain main lymphatic vessels of the body in preference to others in order to reach maturity and lay embryos. Adult filariæ have been found in the main lymphatics of the abdomen near the thoracic duct, in the pelvis of the kidney, in the enlarged varicose vessels of the spermatic cord, near the glands draining the limbs, and in filarial abscesses. The main object of the immature filariæ, as soon as they have penetrated the skin of the arm, leg, etc., is to travel centripetally towards the main large lymphatic channels in which they mature and lay their embryos; the embryos finally finding their way into the blood stream, and so into the Culex mosquitoes. The commonest site in which we have found mature filariæ has been the large lymphatic vessels, either at the hilum of a gland, or in a varicosed lymphatic channel; (Plate I, fig. 1; Plate II, fig. 2).

Immature filariæ are found in the smaller lymphatics, or where the lumen has been diminished by fibrosis (Plate I, figs. 3 and 4). This fact shows that, as soon as the afferent vessels to the gland above are blocked, the filariæ cannot pass any further forward, and have to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

migrate in some other direction (*aberrant migration*) in order to reach a dilated lymphatic channel sufficiently large in size to allow them to develop and attain maturity. The main cause of aberrant migration is therefore lymphatic obstruction above. The filariæ coming from the leg have to traverse three sets of glands in the course of their journey up towards the thoracic duct, *viz.*, the inguinal, pelvic, and abdominal glands; whilst those from the arm area have to traverse two sets of glands, the epitrochlear and axillary. Blockage may occur at any of these sites.

When the adult filaria is in the abdominal group of glands the obstruction is rarely complete; microfilariæ are generally found in the peripheral blood, and such aberrant migration as occurs generally takes place along the lymphatic channels of the spermatic cord, kidney, etc. In the pelvic group of glands the obstruction is usually complete as regards the passage of adult filariæ towards the abdominal lymphatic vessels; consequently microfilariæ are not usually found in the blood, and aberrant migration commonly occurs towards the external and internal iliac regions. When the superficial inguinal glands are involved the obstruction is usually more marked in one limb than in the other; the filariæ have to migrate back into the dilated lymph channels of the limb, causing recurrent attacks of inflammation, with or without abscess formation, conditions so commonly observed in this group of patients. Discussion of this subject in detail would be out of place in this paper, but we hope to deal with it more fully in a subsequent publication. Here we may briefly state our findings in the matter, as follows:—

(*i*) In places in India where the infective season is of short duration; the microfilariæ rate moderate or low, e.g., below 10 per cent., and the age incidence of clinical symptoms of filariasis from 20 years upwards, the filariæ usually reach the main abdominal lymphatic trunks, and microfilariæ can usually be found in the peripheral blood. Obstruction is only partial and results in chyluria, lymphatic-varix of the cord, etc., whilst elephantiasis is but rarely seen.

(*ii*) In places where the infective season is longer in duration; the microfilaria rate higher, between 10 and 20 per cent.; and the chief age incidence from 12 to 15 years, the filariæ may or may not reach the main abdominal lyphatic trunks. If they do so the obstruction is partial, microfilariæ being found in the blood, and the symptoms being as in (*i*). If the obstruction is complete, as shown by œdema of the legs, arms, scrotum, etc., microfilariæ are only rarely seen in the blood.

(*iii*) In places where the infective season extends almost throughout the year; the microfilaria rate is high, over 20 per cent.; and the age incidence 10 years and upwards, the filariæ very rarely reach maturity in the main abdominal lymphatics, so that hydrocele, chylocele, and chyluria are not usually observed, as the obstruction of the lymphatics occurs very early in life. The superficial lymphatics are first involved and here elephantoid conditions of the legs, arms, breasts, etc., are seen as the most common clinical manifestations of filariasis.

These different clinical manifestations of filariasis have been noted to be characteristic of different countries, and of different areas within the same country, and have puzzled many workers on filariasis. Some, indeed, have attributed them to different species of filariæ. We now put forward the view that these different symptoms are one and all due to the same species of filaria, *Filaria bancrofti*, but that the clinical variations are due to differences in the intensity and duration of the infection at different sites in the lymphatic system of the body. In places where a few filariæ injected by mosquitoes at long intervals gain access to the limbs, these pass through the afferent lymphatic channels and glands without causing much irritation or obstruction. On the other hand, in places where large numbers of immature filariæ are being injected month by month by infected mosquitoes into the same persons, immature filariæ penetrate through the skin, irritate the lymphatic glands in sequence as they enter them, and give rise first to inflammation, and then obstruction. The site of obstruction is dependent on how quickly, and where, the lymphatic glands are first destroyed by the passage of the worms through them.

Changes in the Lymphatic Glands.

We may next consider the changes that occur in the lymphatic glands. As the immature worm, injected by the mosquito, travels along the afferent lymphatic and enters the lymphatic gland, it has to work its way along the lymph space between the trabeculæ and the lymphoid nodules of the cortex to reach the medulla. In this situation the passage of the worm is rendered difficult as it has to traverse the dense reticular tissue of the medulla. Sometimes the worm is held up; the tissues react against it; endothelial cells proliferate, and eosinophile cells are seen scattered throughout the area. Plate II, fig. 3 shows such an area through which a worm has passed, leaving eosinophile granulation tissue to mark its course. At other times the immature worm is strangled by the granulation tissue and dies; and giant cells are formed near the dead worms. Plate II, fig. 4 shows an immature male being destroyed by giant cells. When the worm is thus destroyed (Plate II, fig. 5) the granulation tissue becomes vascularised by the formation of new blood vessels and is by degrees converted into fibrous tissue, so that a scar results in the medulla of the gland.

Now one of two changes may occur in such invaded lymphatic glands.

(*i*) When numerous immature filariæ are constantly passing through the gland, the whole gland becomes increased in size and in the course of a short time is converted into a mass of eosinophile granulation tissue, and no longer contains any lymphoid tissue. As the lymph channels are

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PLATE III.

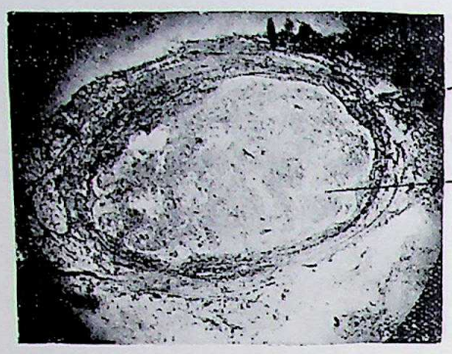


Fig. 1.—Hard and fibrous gland.

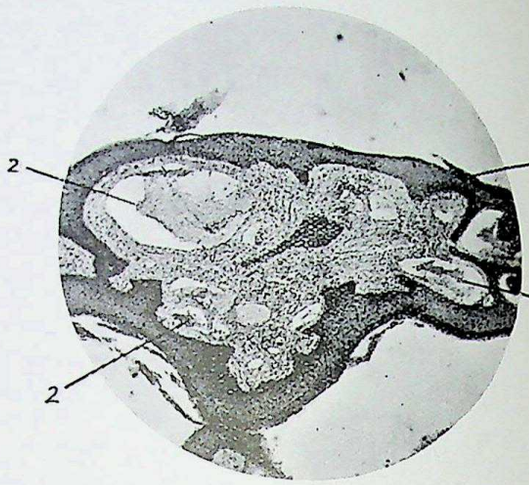


Fig. 2.—Lymphatic cysts.

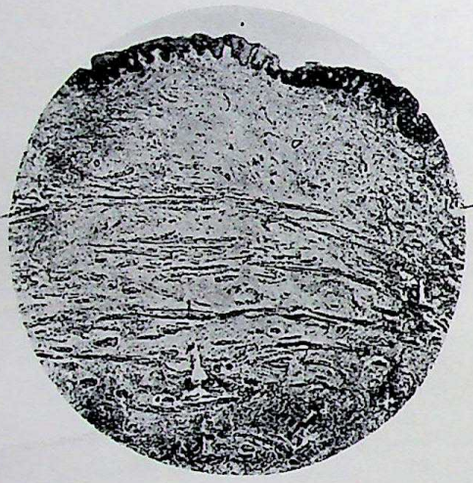


Fig. 3.—Elephantoid skin, showing the dilatation of surface lymphatics and the separation of white fibrils and dartos muscle.

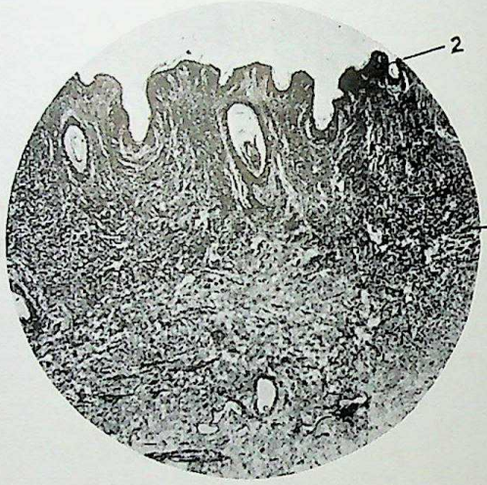


Fig. 4.—Elephantoid skin, showing the fibrous induration extending deep down as far as the sweat glands.

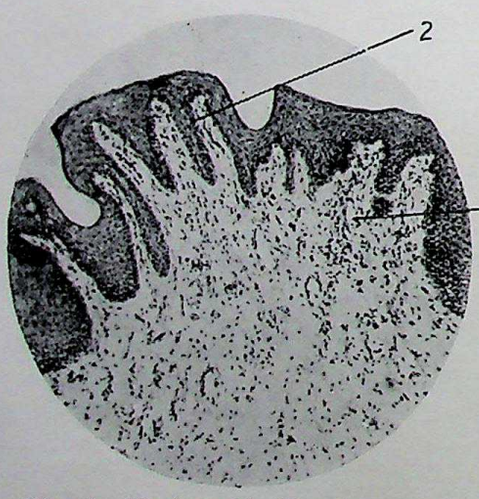


Fig. 5.—Elephantoid skin, showing dilatation of the villus-like lymphatics in the papillæ.

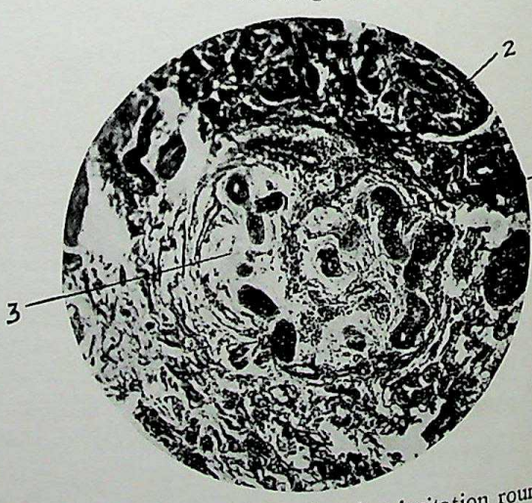


Fig. 6.—Elephantoid skin, showing irritation round the lymphatics draining the sweat glands.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

obstructed by this granulation tissue, lymph can no longer percolate through the gland, and filariæ also cannot possibly pass through it. The afferent vessels are blocked; the lymphatic pressure rises, and the lymphatics below dilate, particularly those situated in the hilum of the next and more distal lymphatic gland. The worms cannot pass forward and are forced to migrate backwards, and mature in the dilated vessels in the hilum of the distal glands (*vide* Plate I, fig. 1 and Plate II, fig. 2). The enlarged gland can no longer be irritated by the passage of worms through it; the granulation tissue becomes further vascularised; scar tissues result, and the gland becomes small in size, hard, fibrous and atrophied (*vide* Plate III, fig. 1). These changes may occur in the abdominal, common iliac, external and internal iliac, and superficial inguinal glands, and are dependent upon the number of injected filariæ that are passing through these glands. In heavily infected places such as Cochin, where the patient is bitten again and again by infected mosquitoes, enlargements of the superficial inguinal, and epitrochlear glands are common, the filariæ being so numerous that blockage occurs towards the distal end of the lymphatic system; on the other hand, in such places as Allahabad, where only light infections occur, and the percentage of infected mosquitoes is very small, involvement of these superficial glands is not seen.

(*ii*) When only few filariæ are passing through the superficial glands for short periods of the year, they leave only microscopic scars in these glands. They penetrate to the deeper lymphatics and the cumulative effect of their toxin is seen at the sites where the mature females are laying their embryos; i.e., near the right and left juxta-aortic glands, causing partial obstruction of the area drained by these glands, and thus giving rise to such conditions as chyluria, chylocele, etc.

Changes in the Skin.

Finally, we have to consider the effect of the immigrant filariæ on the finer lymphatic capillaries of the skin. In persons living in moderately or heavily infected areas the tissues of the limbs, breast, scrotum, or vulva become enlarged and œdematous, and later on both the epidermis and the deeper tissues hypertrophy to produce the enormous pendulous masses or swellings so characteristic of filarial elephantiasis. What happens in such cases is as follows:—Owing to the adenitis produced, the afferent vessels to the gland are obstructed, and the lymph cannot flow freely towards the central lymph system; the tissues below therefore become œdematous and swell. The lymph pressure increases; at first the deeper lymphatic vessels dilate; then those of the subcutaneous tissues; finally those going to the skin; so that more and more plasma is poured out into the tissues, and the part becomes more and more swollen. Plate III, fig. 3 shows this dilatation of the surface lymphatics and the separation of the white fibrils and dartos muscle by exudation of lymph into the tissues. This tissue is known as "blubbery tissue" because when one cuts into it the lymph pours out and the tissue collapses. At this stage there is more or less complete obstruction and hence microfilariæ are not found in the peripheral blood of such patients.

Now let us consider what happens when immature filariæ continue to be injected into such persons by infected Culex mosquitoes. The immature filariæ can no longer reach the abdominal lymphatics and the blood stream; they penetrate to the blocked lymphatic glands and no further. They may be caught and destroyed in their immature stage at this site, as shown in Plate I, figs. 3 and 4, and Plate II, figs. 4 and 5; either in thickened lymphatics or in the gland substance. More often they migrate downwards or laterally into areas where the lymphatics are enlarged, and where they can develop and attain maturity. Plate I, fig. 1 shows mature females with embryos *in utero in situ*, and Plate II, fig. 2 mature males and females in the enlarged lymphatics at the hilum of the superficial inguinal glands.

When the internal group of the superficial inguinal glands are obstructed, the worms migrate back through the dilated lymphatics of the scrotum, where they mature and commence to lay embryos. This aberrant migration of the maturing filariæ is due to their endeavours to reach lymphatics of a sufficiently large calibre to allow of their maturing and attaining full development, and this condition explains the many fugitive swellings, abscesses, etc., that are so often characteristic of filariasis. That is to say, when obstruction is complete above, many of the filariæ do not reach maturity, but die in the lymphatics and are absorbed, whilst others which are able to gain access to a suitably large lymphatic channel develop to maturity, copulate, and commence to lay embryos. These embryos, however, cannot gain access to the blood stream, but are compelled to remain in these obstructed lymphatics. Now blood is probably very necessary to the life of the embryos; it probably provides them with certain diffusible foodstuffs, such as sugar. Whether this is so, or not, the microfilariæ from such worms ultimately die in the obstructed lymph stream, and are carried down by gravity or by back pressure to the finer lymph vessels of the skin. They irritate these finer lymph vessels all along their course, as is seen by the presence of endothelial hyperplasia. Thus Plate III, fig. 6 shows irritation round the lymphatics draining the sweat glands. In this way the fine villus-like lymphatics in the papillæ undergo dilatation (Plate III, fig. 5), and, as the lymph flow is obstructed from the surface, the papillæ hypertrophy. At the same time the surface horny layer does not keratinise properly, and therefore there is a loss of surface protection against the invasion of the skin by bacteria. Often a group of these surface villus-like lymphatics are obstructed, and the skin over them hypertrophies,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and becomes raised—forming lymphatic cysts (Plate III, fig. 2). When these cysts are pricked lymph, which may or may not contain micro-filariæ, oozes out of them.

After many years of such chronic filarial irritation of the tissues, or sometimes in a few years' time, when subacute or acute bacterial inflammatory attacks occur in the skin, the fibroblasts in the blubbery skin multiply and form new fibrous tissue, which makes the skin dense and hard—the typical elephantoid skin (*vide* Plate III, fig. 4). The fibrous induration extends deep down into the tissues as far as the sweat glands, and, interfering with the lymphatics in this region, first produces œdema around the sweat glands, (*vide* Plate III, fig. 6). Fibrosis follows, and eventually the glands are destroyed, so that the skin in elephantiasis is always harsh and dry. In the meanwhile the surface hypertrophy of the epidermis has become more and more marked (Plate III, figs. 3, 4, and 5); fissures occur in the ill-developed horny layer, allowing micro-organisms to invade the corium. In these very large warty elephantoid limbs repeated attacks of inflammation due to infection coming from the surface are extremely common, and increase the œdema and exhaust the patient.

Kataphylaxia in Filariasis.

In a previous article (Acton and Sundar Rao, 1929), we have shown that most of the serious lymphatic obstruction that is produced in the lesion known as elephantiasis is not due to the *Filaria bancrofti* itself, but is caused by such invading pyogenic cocci as staphylococci and streptococci. The former organisms produce localised areas of inflammation around the dead worms, which may or may not go on to suppuration (filarial abscess). The latter may produce acute attacks of lymphangitis, cellulitis, or periadenitis which may in itself cause a lymphatic obstruction with a condition comparable to the elephantiasis nostra of Europe. This condition is not due to the *Filaria bancrofti* itself, and the lesion resembles "white leg." In our former paper we pointed out that these cocci might be derived from either external or internal foci, and in many instances we were able to show conclusively that this is so by isolating the same type of organism from some septic focus as well as in the local inflammatory area. Such micro-organisms gain access to the blood stream from the source of focal sepsis, and settle down in the area involved in the acute filarial inflammatory process in preference to any other in the body. The staphylococcus produces localised areas of inflammation, associated with a low grade of fever, 99°F. to 101°F., and with moderate leucocytosis, 10,000 to 14,000 per c.mm. The lesions may be suppurative or non-suppurative. In the latter case the clinical manifestations are periadenitis around the superficial inguinal glands, e.g., the inguinals, saphenous, and epitrochlear; orchitis; or inflammation around aberrant migrated filariæ in the limbs, breasts, or spermatic cord. Suppuration may take place around the filariæ in the lymphatic glands in any of these situations. Clinically identical lesions may be produced either by the filariæ alone or by them in conjunction with staphylococci. In the case of staphylococcal superinfections we get pus cells in the exudate and on culture the *Staphylococcus aureus* or *mollis;* in the purely filarial cases the inflammatory tissue consists of an eosinophile granulation tissue which may undergo caseation and softening. The pus is sterile, and there is only slight fever and moderate leucocytosis. Plate I, fig. 1 shows a mixed filarial and bacterial infection of the gland.

On the other hand, more virulent infections occur as the result of streptococcal invasion of the tissues. These can never be mistaken for purely filarial manifestations. The symptoms and signs are those of a profound and sudden toxæmia, with high fever, 103°F. to 105°F., a rapid pulse, and more marked leucocytosis, 12,000 to 16,000 per c.mm. The clinical syndromes known as filarial colic (i.e., infection of the retro-peritoneal tissues and lymphatics), endemic funiculitis (i.e., infection of the lymphatics of the spermatic cord), filarial cellulitis of the tissues of the limbs or breast, and acute filarial lymphangitis around the vessels coming from some external septic focus are of this origin. In filarial colic death is usually due to an acute septicæmia and toxæmia; in endemic funiculitis to a generalised streptococcal peritonitis. In cellulitis and perilymphangitis the attack commences with a rigor and high fever; as a rule suppuration does not occur, and the inflammation subsides in a few days. A few sharp attacks of these streptococcal infections of the limbs or breast produce in a very short time a lymphatic obstruction which it would take some years for filarial obstruction alone to have produced. Microscopically such streptococcal infection can easily be recognised by the inflammatory œdema around the lymphatic vessels (*vide* Plate IV, fig. 2), the fluid containing relatively few polymorphonuclear leucocytes.

We will next explain the reason why the combination of filarial lymphatic obstruction and the sharp attacks of streptococcal or staphylococcal infection in this devitalised and œdematous tissue gives rise in a very short time to the enormous elephantoid condition of the legs, arms, breasts, scrotum, vulva, etc., in certain individuals, the inflammation recurring time after time in the same area. This condition is brought about by kataphylaxia, a condition in which a break-down occurs in the local defence-mechanism of the tissues. The filariæ have been shown to irritate the mesoblastic tissues in three ways:—

(*i*) The filariæ cause a localised irritation of the reticulo-endothelial cells of the lymphatic glands, which lowers their resistance and renders them more vulnerable to attack by various pyogenic cocci. Colour Plate IV, fig. 1 illustrates this point very clearly. We are indebted to Dr. J. M. Henderson, Research Worker under

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PLATE IV.

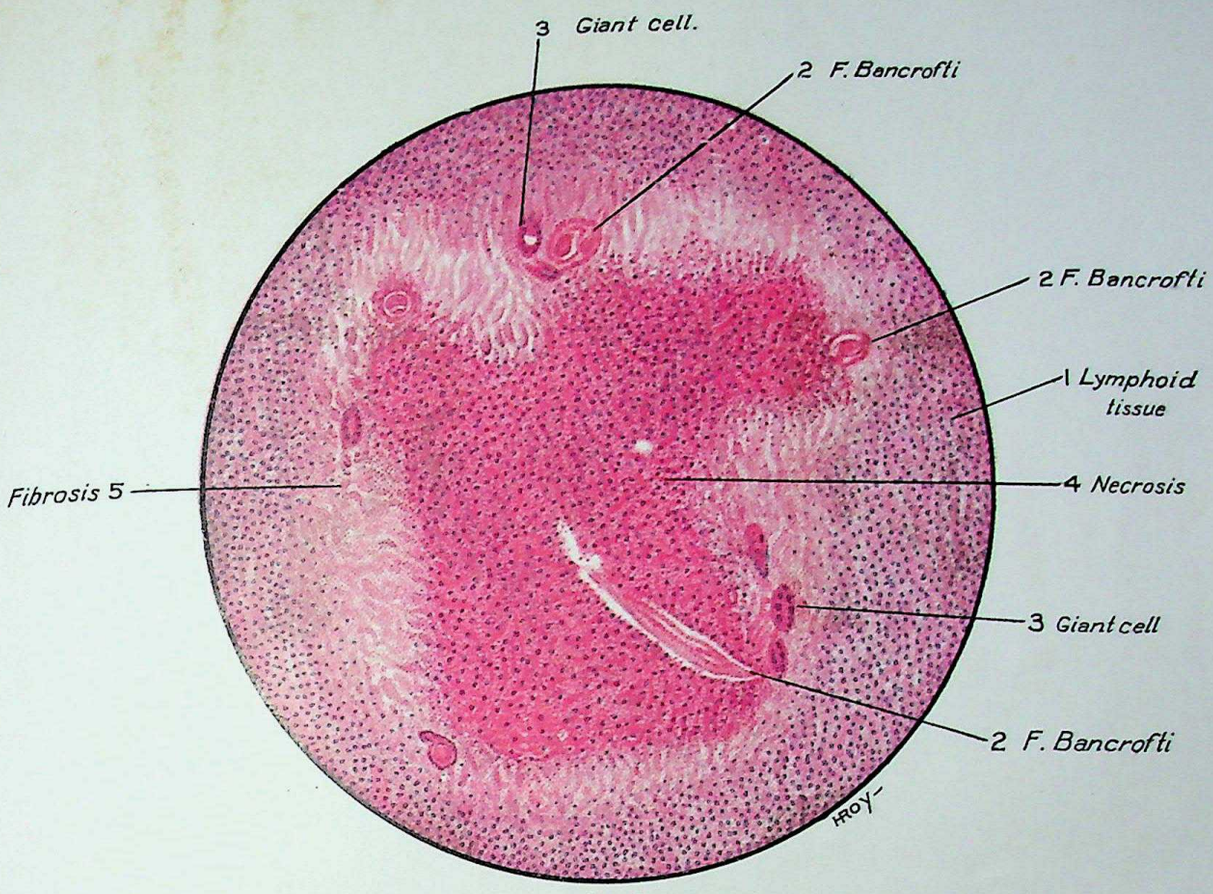


FIG. 1.

Section of a lymphatic gland, showing a localised irritation of the reticulo-endothelial tissue.
Zeiss 8 mm. obj. × 10 ocular.

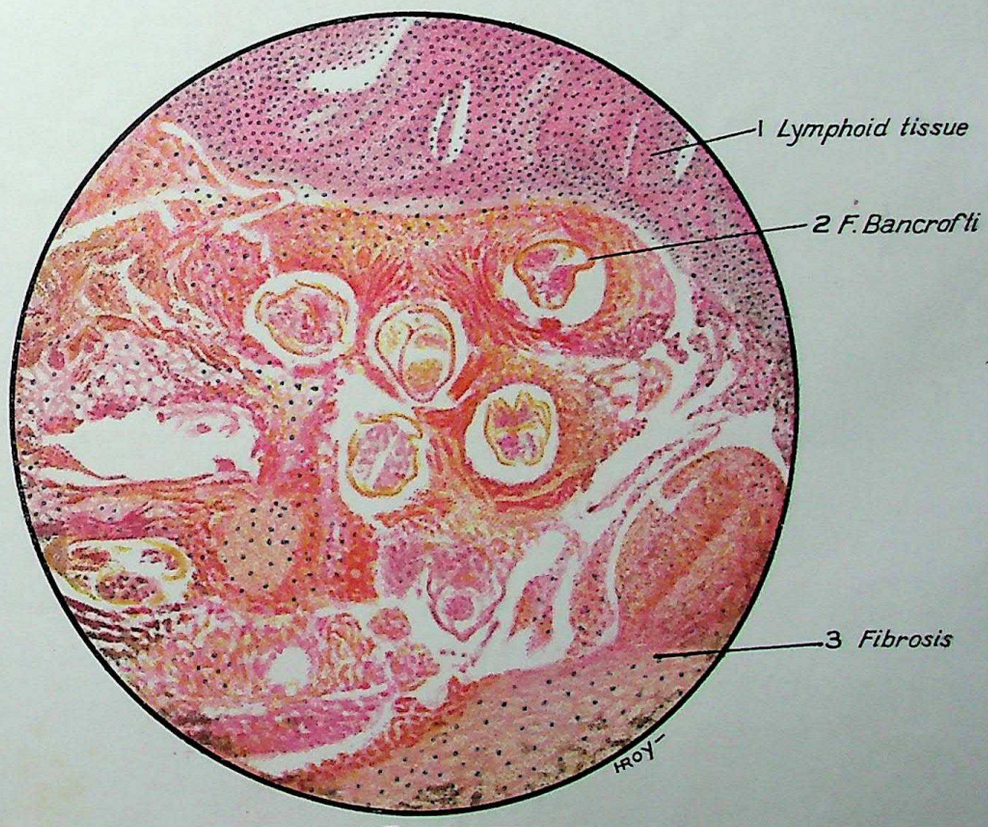


FIG. 2.

Section of a lymphatic gland, showing the inflammatory œdema round the lymphatic vessels.
Zeiss 8 mm. obj. × 10 ocular.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the British Empire Leprosy Relief Association, Calcutta School of Tropical Medicine, for the absolutely unique specimen illustrated in this plate. During the course of his researches on leprosy Dr. Henderson was removing suspiciously enlarged lymphatic glands in the vicinty of leprous lesions and examining sections of them to see if they were invaded by the lepra bacillus. At that time we were inclined to believe that filarial obstruction only affected the large and main lymphatic glands, and had not realised the importance of the more superficial and smaller glands. The obstructed glands are found to consist of a mass of granulation or fibrous tissue, and the density of the inflammatory tissue makes it impossible for any filariæ to travel through the glands. Plate IV, fig. 1 has been drawn from Dr. Henderson's specimen and was shown to the members of the Far Eastern Association of Tropical Medicine at the Seventh Congress in Calcutta in 1927. (The sections are rather thick; photographs alone would give only a very poor idea of the general structure, hence we have resorted to a colour plate rather than a photograph. Plate II, fig. 4, however, shows the same condition photographically.) In this specimen the worm, an immature male, has been caught and entangled in the reticulo-endothelial tissue of the medulla of the lymphatic gland, and an eosinophile granulomatous reaction has occurred around it. At the site of maximum irritation giant cells are seen on the outer side of the worm. Five different sections of the coiled worm are seen, four of them cut transversely and one obliquely. The centre of the field, stained a deeper red, consists of endothelial cells undergoing necrosis. The lighter area around this consists of the endothelial granulation tissue with giant cells, and the darker blue area is the normal lymphoid tissue of the gland. This affected area would in time have been vascularised by the formation of new blood vessels; when micro-organisms in the blood stream reach such a devitalised area they multiply in it and give rise to repeated attacks of local inflammation—such attacks being far more often due to concomitant bacterial infection than to purely filarial irritation alone; periadenitis follows, and the gland finally becomes hard and fibrotic (Plate III, fig. 1).

(*ii*) In Plate IV, fig. 2 the section shows dilated lymphatics in the hilum of a gland containing adult female filariæ. Around these lymphatic vessels œdema of the tissues with leucocyte immigration of polymorphonuclear cells is seen. The endothelial lining of the vessels cannot be made out in the section, owing to its desquamation. This inflammation is most probably due to a secondary streptococcal infection. The filarial toxin has caused desquamation of the walls of the lymphatic channels and dilatation of the vessels in the neighbourhood. The increased vascularity in this devitalised tissue has allowed the secondary streptococci to produce their characteristic inflammatory reaction. Such secondary bacterial inflammatory attacks inside the gland may give rise to fibrosis, fibrosis tissue gradually replacing the lymphoid tissue (*vide* Plate II, fig. 6).

(*iii*) When œdema occurs in the limbs, scrotum, etc. (as shown in Plate III, figs. 3, 4, and 5), not only does the stagnant lymph form a suitable nidus for the growth of pyogenic cocci, but its presence causes devitalisation of the cellular resistance, and makes the tissues more vulnerable to attack by these bacteria.

Finally, the defence mechanism of the surface layer or epidermis is gradually being impaired as the elephantiasis of the part is increasing in size. As the lymph cannot be properly drained away from the surface areas owing to the blockage of the terminal villous lymphatics in the papillæ, and owing to inflammatory changes in the junctional vessels in the region of the sub-papillary plexus, it accumulates and percolates upwards to the prickle cell layer, producing hypertrophy of the papillæ (*vide* Plate III, figs. 4 and 5). At the same time the keratinisation of the horny layer is interfered with, so that the mechanical protection afforded by this layer is partially or completely lost. On the upper aspect of the foot and instep, and in the scrotal skin, groups of these terminal lymphatics may be involved in this obstructive inflammatory lymphangitis, so that the epidermis is thrown into large papillomatous growths (*vide* Plate III, figs. 2 and 4), and dilated terminal lymphatics are seen giving rise to the so-called lymphatic cysts of the skin. Deep fissures form in the papillomatous area, owing to movements of the limb and the rigidity of the tissues of the corium, and the tissues are very prone to attack by secondary septic infections from the surface. Secondary streptococcal infections under such conditions more usually come from foci situated on the skin, whereas staphylococcal infections are more commonly derived from internal septic foci.

Summary and Conclusions.

1. The distinction between anaphylaxia or allergy, where there is a generalised hypersensitiveness of certain mesoblastic cells due to leakage of certain protein poisons into the circulation, and kataphylaxia—the localised break-down of cell defence-mechanism—is clearly brought out.

2. Earlier researches on the correlation of these manifestations with certain diseases are briefly reviewed.

3. It is shown that in kataphylaxia (which is the more important of the two conditions mentioned) tissues derived from the epiblast, hypoblast and mesoblast respectively may be involved, and are discussed in this paper.

4. In filariasis two types of kataphylaxia occur; i.e., a lowering of the mesoblastic tissue-defence owing to irritation by the filaria, or œdema and an epiblastic type seen in elephantiasis, when the surface protection of the epidermis is impaired by hypertrophy.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

5. A large number of filarial cases have been studied with special reference to the presence of a toxin in this nematode, and the evidence for kataphylaxia. Though the presence of a toxin cannot be proved experimentally in the case of *Filaria bancrofti*, as has been done in the case of *Filaria medinensis*, circumstantial evidence, such as the onset of an eosinophile reaction, suggests the presence of a toxin. In persons with micro-filariæ in their blood there is a higher percentage of eosinophile count than in those without them.

6. Additional proof of the existence of a toxin is obtained from the irritation and subsequent changes in the tissues brought about by the worm, similar to the effects produced by the guinea-worm.

7. It is suggested that these toxins produce allergic symptoms such as urticaria, periodic headaches, migraine, slight rises of temperature, etc.

8. The nature of the lesions caused by the filarial infection is discussed and it is shown that they are of two kinds—helminthic and bacterial. In the case of the former, the lesions are of a chronic type with a distinct eosinophile reaction, and in the latter an acute inflammatory type with a polymorphonuclear leucocyte exudate.

9. The action of the toxin on the lymphatics, leading to the formation of the different types of filarial diseases, is discussed in detail. Greater reaction of the lymphatic wall near the head (vulval) end of the worm points to a localisation of the toxin at this end. From a detailed study of a large number of glands and lymphatics from cases of filarial infection, it is concluded that this toxin sets up partial or complete obstruction by gradually bringing about desquamation and hypertrophy of the endothelal cells of the lining of the lymphatics, and thickening of the vessel walls. The progressive changes in the structure of the gland by the passage of the immature worms through it, or through the death of the immature worm during its passage, are reviewed.

10. The reason for the absence of micro-filariæ in advanced cases of filarial disease, and aberrent migration of the adult worm leading to the aggravation of the pathological condition, are briefly indicated.

11. The changes taking place in the skin in cases of elephantiasis as a result of pathological changes in the tissue due to causes acting both from within and from without—in the latter case as a result of secondary infection—are described in detail.

12. The evidence of kataphylactic state is obtained from (*i*) a localised irritation of the reticulo-endothelial tissue of the lymphatic glands which lowers their defence and renders them more vulnerable to attack by the various pyogenic cocci: (*ii*) the production of œdema of the tissues with leucocytic migration of the polymorphonuclear cells and desquamation of the endothelial lining of the vessels: (*iii*) lymph stasis in the extremities and scrotum, lowering the cellular resistance and favouring the growth of pyogenic cocci: (*iv*) the gradual changes in the epidermis with the production of hypertrophy of the papillæ, papillomatous growths and lymphatic cysts of the skin, with secondary bacterial infection from external foci.

REFERENCES.

Acton, H. W., and Chopra, R. N. (1925). The Problem of Epidemic Dropsy and Beri-beri. *Ind. Med. Gaz.*, January 1925, p. 1.

Acton, H. W., and Sundar Rao, S. (1929). The importance of secondary infection in the causation of Filarial Lymphangitis. *Ind. Med. Gaz.*, August, 1929, p. 421.

Banerjee, K. P. (1929). Streptococci and their importance in the treatment of Tropical Diseases. *Transactions F. E. A. T. M.*, 1927, Calcutta.

Besredka, A. (1925). *Immunisation Locale.* Paris.

Cramer, W. (1924). Vitamins and borderland between health and disease. *Lancet*, 1, p. 633—640, March, 29.

Cramer, W., and Kingsbury, A. N. (1924). Local and general defences against infections and effect on them of vitamin deficiencies. *Brit. Journ. Exp. Path.*, V, p. 300. October.

Forman, D. N., and Pitale, N. A. (1928). Filariasis: A clinical study based on fifty-two dispensary cases. *Journ. Christ. Med. Assoc. of India*, Vol. III, May, p. 41.

Fujimaki (1926). *Japan Medical World*, February, VI, p. 2.

Gye, W. E., and Cramer, W. (1920). Note on defence rupture and action of electrolytes. *Journ. Hyg.*, XVIII, p. 463.

Gye, W. E., and Kettle, E. H. (1922). Silicosis and miners' phthisis. *Brit. Journ. Exp. Path.*, III, p. 241.

Hamilton-Fairley, N., and Glen Liston, W. (1924). Studies in the pathology of Dracontiasis. *Ind. Journ. Med. Res.*, Vol. XI, 1923-24, p. 915.

McCarrison, R. (1927). Experimental production of stone-in-bladder, with a note on pernicious anæmia and epidemic dropsy. *Ind. Journ. Med. Res.*, 14, 1926-27, p. 895.

Panja, G., and Banerjee, K. P. (1927). Causation of Cystitis. *Ind. Med. Gaz.*, May, p. 249.

Semple, D. (1911). The relation of Tetanus to the Hypodermic or Intramuscular injection of Quinine. *Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India*, No. 43.

Taylor, G. (1917). Note on the prevalence of Bovine Tuberculosis in the Punjab. *Ind. Journ. Med. Res.*, Vol. V, p. 497.

A CASE OF HUMAN INFECTION WITH A GNATHOSTOME IN INDIA.

By P. A. MAPLESTONE, D.S.O., M.B., Ch.B., D.T.M.

(*From the Hookworm Research Laboratory, Financed by the Indian Jute Mills Association.*)

Calcutta School of Tropical Medicine and Hygiene.

SINCE "creeping eruption" was first described by Lee (1874) in England, it has been recorded from almost every country in the world, but although its manifestations in different countries are similar, it is now known to be caused by a variety of parasites.

Broadly speaking, creeping eruption of temperate climates is due to invasion of the subcutaneous tissue by larvæ of various species of the family *Œstridæ*, and creeping eruption of the tropics and sub-tropics is caused by immature nematodes.

The frequency of creeping eruption was first noted in Florida and the Southern United States

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

by Kirby-Smith (1925), and subsequently Kirby-Smith, Dove and White (1926), White and Dove (1927 and 1928), Shelmire (1928), and Kirby-Smith (1929) have clearly proved that in this locality the disease is due to larvæ of *Ancylostoma braziliense*. In Australia, Heydon (1929) found that the same species of larvæ is the causal factor, and he is also inclined to incriminate the larvæ of *A. caninum*. Cawston (1928) is of the opinion, on clinical and epidemiological grounds, that creeping eruption or "sandworm disease" as it is known in Natal, is due to the same cause. Thus in the course of about four years, since its first recognition, this form of creeping eruption has been identified in three widely separated countries, so it is probable that it will soon be found in other places as well. At the same time, frequency of infection of dogs and cats with *A. caninum*, and *A. braziliense* does not necessarily mean that creeping eruption will be common among human beings, for although practically all the dogs and cats of Calcutta harbour one or both of these parasites, the writer has been informed by Lieut.-Col. Acton, I.M.S., that no case of this condition has been seen at the skin clinic of the Calcutta School of Tropical Medicine, where many thousands of cases have been treated annually for the past seven years.

The third type of creeping eruption is caused by an immature Gnathostome, and is much less common, and as far as is yet known it is much more limited in distribution. The first case of human Gnathostome infection was reported by Levinsen (1889) who identified a worm removed from an abscess of the breast of a Siamese woman by a Dr. Deuntzer. This observer said he had seen two similar cases but he did not find the parasite. Levinsen named the worm *Cheiracanthus siamense*.

The second case of this disease also came from Siam, the parasite being removed from the skin by a Dr. Kerr, who sent it to Prof. Leiper for identification. Leiper (1909) described this worm, and considered it to be identical with Levinsen's specimen, the name of which he corrected to *Gnathostoma siamense* (Levinsen, 1889). Following the examination of the type specimens of *Cheiracanthus robustus* Diesing, (1838) in Vienna, Leiper (1911) expressed the opinion that *C. robustus* Diesing, 1838, and *Gnathostoma spinigerum* Owen, 1836, were probably identical, and that *G. siamense* was also the same species. Therefore the correct name of the two Gnathostomes recovered from human beings was *Gnathostoma spinigerum* Owen, 1836.

The third case was reported from the Malay States by Samy (1918), who obtained his specimen from an abscess on the thenar eminence of a Chinaman, who had never been in Siam. This worm was identified as *G. spinigerum*.

The fourth case was that of a Japanese woman who had lived for a long time in China. She developed an abscess of the breast and the parasite was found on opening it. Tamura (1921) gave a full account of this case and a careful description of the parasite, which leaves little doubt that it was an immature male of *G. spinigerum*.

Robert (1922) reported three cases in Siam. The first patient was seized suddenly with a spasmodic cough, which lasted for about a day, and which resulted in the expulsion of a Gnathostome. The second began with swelling of the right hand which subsided and was followed by swelling of the right arm; a similar condition occurred later in the right foot, to be followed by patches of œdema on the abdomen, from the last of which the parasite was expressed. From the first onset to the expulsion of the parasite a period of eight months elapsed. The third case exhibited hæmaturia and hæmatemesis, which was succeeded by a localised œdema on the abdominal wall from which a worm was obtained. Robert does not say that the hæmorrhages were due to the parasite, they may have been merely coincident.

The eighth case, reported by Morishita (1923, 1924), was from the thenar eminence of an adult male Japanese who had lived for a long time in Tokyo. This case is consequently regarded as indigenous to Japan. Although it was somewhat damaged, Morishita was able to identify the worm with certainty as a specimen of *G. hispidum* Fedtschenko, 1872.

Two other cases, which have been reported, are those of Morishita and Faust (1924). Both of these worms were obtained from male Japanese who were resident in China; one specimen was from a serpiginous eruption on the left shoulder, the site of the other is not stated. Both worms were very immature and one of them had no body spines nor transverse, striations, but in other respects it was so much like the second example, that they consider it justifiable to identify both specimens as specimens of Gnathostoma species, and possibly *G. spinigerum*.

The present case, which came to the writer's notice, is the first record of the condition in India. The patient was a Mahommedan male *act.* twenty-six years, and a clerk by occupation. He has been resident in Jalpaiguri for many years, and he has never been out of Bengal. He first noticed a swelling between the thumb and first finger of the right hand, which gradually extended, involving first the dorsum and then the palm of the hand, in the course of three or four days. There was no pain nor tenderness, but the epitrochlear gland was enlarged. The swelling then spread to the right middle finger, which was somewhat red and painful, and in about two days time the patient noticed a small whitish point near the tip of the finger. He opened this with a needle, and the worm escaped from the puncture, accompanied by a serious discharge. All signs of inflammation rapidly subsided after the worm was removed. Previous to the present attack the patient had a

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

similar swelling of the right hand, which first appeared about seven years ago, and which lasted for about ten days. Ever since that time he has had attacks of the same nature at intervals of a year or more, this has been diagnosed as of filarial origin, but microfilariæ have never been found in the blood in spite of repeated examinations.

The Parasite.

The worm is only slightly shrunken and is about 3.56 mm. in length, by 0.42 mm. in greatest diameter. The head bulb is 0.34 mm. in breadth and 0.20 mm. in length. There are two lateral crescentic lips each bearing two papillæ. The

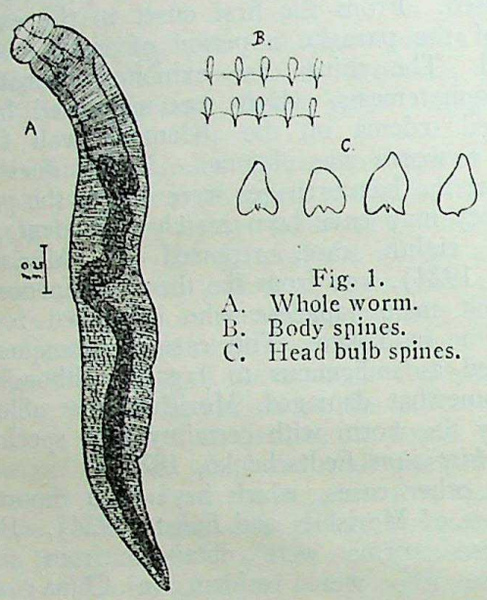


Fig. 1.
A. Whole worm.
B. Body spines.
C. Head bulb spines.

external surface of the lips is smooth, but internally three lobes are visible, indicating that when the worm is more fully developed the lips would probably be three-lobed structures, typical of the genus *Gnathostoma*. The head bulb is

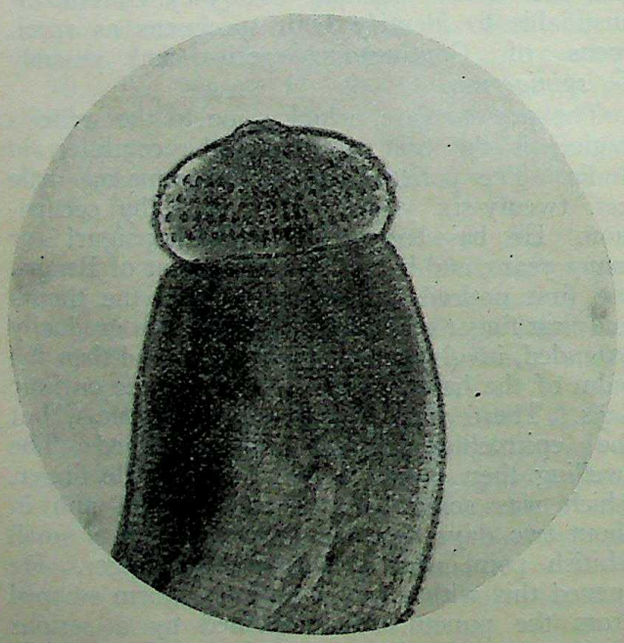


Fig. 2.—Photomicrograph of anterior portion of worm showing broad roots of spines on head bulb, and raised transverse striations.

armed with four rows of spines numbering about forty in each row. These spines have only a short sharp point projecting backwards through the cuticle, but beneath the cuticle they are seen to have broad roots of slightly varying shape. Usually there are two rounded or occasionally pointed processes running backwards beneath the skin, one on each side of the projecting spine; in some cases these lateral processes almost pierce the cuticle. The spines, including the roots, measure 12 to 16 μ in length, and 9 to 14 μ in breadth. The cuticle of the body is furnished with raised transverse ridges about 12 μ apart, and rows of spines project posteriorly from these ridges. They have simple sharp points, and beneath the skin the roots appear as simple oval structures. The length of these spines from root to tip is about 7 to 8 μ, and near the anterior end of the worm they are about 6 μ apart; they extend to the extreme posterior end of the worm, but they gradually become more widely separated in successive rows from before backwards, so that near the posterior end of the worm they are 15 to 20 μ apart in each row. Very little internal structure could be made out, probably on account of imperfect fixation, but towards the anterior end there is a suggestion of ballonets, and behind these there is a broad clear œsophagus, which is followed by a dark intestine. The intestine follows a slightly wavy course to terminate in an anus near the tip of the tail. No genitalia are present, probably because the worm is too young.

Discussion.

Most of the worms described by other workers have been much more fully developed than is the writer's specimen, and consequently they have been specifically identified, but the two specimens from Morishita and Faust's cases are of approximately the same size as the writer's, and it is interesting to note that all three of these specimens have only four rows of spines on the head bulb. But the similarity ends here, for in Morishita and Faust's specimens the spines are only 10 μ in length by 5 μ in breadth, and they are described as simple structures, whereas the writer's specimen bears head spines which are much larger and which have broad complex roots. It is conceivable, that on fuller development these head spines might have three points projecting from the cuticle, as there is already an indication of these extra points beneath the skin. Another interesting fact is the presence of rows of simple spines throughout the length of the worm; these of course might give place to multi-pointed spines on fuller development, but it is not likely that the spines on the posterior part of the body would disappear completely. Therefore it seems unlikely that the writer's specimen is an immature example of *G. spinigerum* because the spines do not extend to the posterior extremity in this species; nor is it likely to be an immature

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

example of *G. hispidum*, because, although the body spines of this species extend throughout the length of the worm, the head spines of *G. hispidum* are simple structures. It therefore seems possible that this specimen may be a young worm of a species not yet recognised.

The finding of this immature worm with a suggestion of three-pointed spines on the head bulb raises the question whether *G. spinigerum* Owen, 1836, and *G. robustum* (Diesing, 1838) are really identical, for Owen (1836) in his original description stated that the spines on the head bulb had three points, similar to those on the body of the worm. As far as can be ascertained, Owen's original material has not been re-examined, but Leiper (1909) says that *G. robustum* of Diesing is most probably a synonym of *G. spinigerum* Owen. Leiper (1911) examined Diesing's original material of *G. robustum* in Vienna and he says it ".....is acceptedly the same as *Gnathostoma spiningerum* Owen, of the tiger." This view is now generally accepted, for Baylis and Lane (1920) in their exhaustive revision of the family *Gnathostomidæ* go even further and define the genus *Gnathostoma* as having simple spines on the head bulb. The fact that Owen described triple-pointed spines on the head bulb seems to have been ignored without comment, and his species has been made to include specimens which have single spines on the head bulb. Under the circumstances it would seem preferable to leave Owen's species intact until it is definitely known whether Gnathostome species do or do not exist with complex head spines, and at the same time to re-erect *G. robustum* (Diesing, 1838), as a distinct species, and to place in it all those specimens which Leiper's researches have shown to be identical with Diesing's type material.

Although a search of the literature has only produced ten cases of human infection with a Gnathostome, in which the parasite has been recovered, it is obvious, from the excellent paper of Robert (1922), that this condition is a common and definitely recognised clinical entity in Siam, which is the most important endemic centre of the disease. Robert says the disease is always characterised by transient and migrating œdema, and apparently the serpiginous raised line regarded as characteristic is only exceptionally present, when the worm is burrowing just beneath the skin. More often the parasite is situated deeper in the tissues, when all that is manifest on the skin is an œdema which moves from place to place as the parasite proceeds through the tissues. Many cases in Siam undergo spontaneous cure without the parasite being found; Robert considers this may occur in one of two ways. Either the worm dies *in situ*, or else it may be spontaneously evacuated through an internal mucous surface. In support of the latter method of cure being common there is Robert's first case in which the worm was coughed up, and the same author quotes the case of an intelligent and reliable Siamese lady who described to him the escape of a worm from the side of her tongue.

Nothing is yet known of the etiology of the disease, for the life history of the causative parasite is only most imperfectly understood. Robert says that after most careful inquiries lasting over a period of twenty-five years he has only been able to hear of one case in a male; he is therefore inclined to consider that infection is probably acquired during some typically female domestic work such as the preparation of food. Against this observation of Robert, that it is essentially a disease of females, is the fact that out of the six cases reported in this paper, which have come from outside Siam, only one was in a female. It has been suggested that infection may occur by the accidental ingestion of an insect intermediate host of the worm, or that the young worms have a free-living stage during which they have the power of penetrating the skin. In support of the latter view is the fact that of the eleven cases reported above at least four have occurred in the hand.

The behaviour of the worm in the human being probably represents the wanderings of a parasite in an unsuitable host, in which it is not able to reach full development, but it should be borne in mind that although the larvæ of *A. braziliense* behave in a similar manner in certain individuals, in others they are able to reach the small intestine and to undergo full development. It is therefore possible that in the course of time, exceptional cases of Gnathostome infection in human beings will be encountered in which the worm has reached the stomach and undergone full development, as it does in its normal hosts. Fulleborn (1927) has produced a similar condition to the eruption caused by *A. braziliense*, by the application of the larvæ of *Uncinaria stenocephala* to his own skin, so it seems probable that many other larval nematodes eventually will be found to produce allied skin lesions when they gain entrance to man, he not being the suitable host.

The discovery of the worm described above, in a man who has never been out of Bengal extends the distribution of human *Gnathostomiasis* to the Westward of its hitherto known distribution, because, since its first recognition in Siam the only other countries in which it has been found are once in the Malay States, once in Japan, twice in China, and once in a Japanese recently returned from China.

The writer is indebted to Captain K. M. Basu, I.M.S., of Jalpaiguri, first for sending the specimen, and later for supplying notes of the case.

References.

Baylis, H. A., and Lane, Clayton (1920). A revision of the Nematode family Gnathostomidæ. *Proc. Zool. Soc. Lond.*, 1920, p. 245.

Cawston, F. G. (1928). The Creeping Eruption of Natal known as Sandworm Disease. *Journ. Trop. Med. and Hyg.*, Vol. 31, p. 201.

Fulleborn, F. (1927). The Helminth Parasites in their Hosts. Quoted in the *Lancet*, Vol. I, 1928, p. 197.

Heydon, G. M. (1929). Creeping Eruption or Larva Migrans in North Queensland, and a Note on the Worm

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Gnathostoma spinigerum (Owen). *Med. Journ. Australia*, Vol. I, 16th Year, p. 583.

Kirby-Smith, J. L. (1925). A Consideration of Creeping Eruption in the Southern States with an Entomological Report. *Southern. Med. Journ.*, Vol. 18, p. 402.

Kirby-Smith, J. L. (1929). Some Observations on Creeping Eruption. *Amer. Journ. Trop. Med.*, Vol. 9, p. 179.

Kirby-Smith, J. L., Dove, W. E., and White, G. F. (1926). Creeping Eruption. *Arch. Dermatol. and Syph.*, Vol. 13, p. 137.

Lee, R. J. (1874). Case of Creeping Eruption. *Trans. Clin. Soc. Lond.*, Vol. 8, p. 44.

Leiper, R. T. (1909). The structure and relationship of *Gnathostoma siamense* (Levinsen). *Parasitol.*, Vol. 2, p. 77.

Leiper, R. T. (1911). Notes on Recent and some Records of Helminths in Man of which there are few Records. *Journ. Lond. School Trop. Med.*, Vol. I, p. 16.

*Levinsen, G. M. R. (1889). Om en ny Rundorm hos mennesket *Cheiracanthus siamensis* n. sp. *Vidensk. meddel. fra naturh. Foren. i. kjbenhaven.* f. 1889, p. 323.

*Morishita, K. (1923). Ueber einer neuer Erreger von "Creeping Disease." *Jap. Journ. Dermatol. and Urol.*, Vol. 23, p. 32.

*Morishita, K. (1924). A Pig Nematode *Gnathostoma hispidum* Fedchenko as a Human Parasite. *Ann. Trop. Med. and Parasitol.*, Vol. 18, p. 23.

Morishita, K., and Faust, E. C. (1924). Two New Cases of Human Creeping Disease (*Gnathostomiasis*) in China, with a note on the infection in Reservoir Hosts in China Area. *Journ. of Parasitol.*, Vol. 11, p. 158.

Owen, R. (1836). *Proc. Zool. Soc. Lond.*, Part 4, p. 123.

Robert, L. (1922). La Gnathostomose Humaine, Œdème Ambulant siamois dû à *Gnathostoma spinigerum* (R. Owen, 1836). *Bull. Soc. Path. Exot.*, Vol. 15, p. 854.

Samy, P. C. (1918). *G. siamense* or *G. spinigerum*. *Ind. Med. Gaz.*, Vol. 53, p. 346.

Shelmire, B. (1928). Experimental Creeping Eruption from a Cat and Dog Hookworm (*A. braziliense*). *Journ. Amer. Med. Assoc.*, Vol. 91, p. 938.

Tamura, H. (1921). On Creeping Disease. *The Brit. Journ. Dermatol. and Syph.*, Vol. 33, p. 81.

*White, G. F., and Dove, W. E. (1927). Dogs and Cats concerned in the Causation of Creeping Eruption. *U. S. Dept. Agric.*, Vol. 5, No. 43.

*White, G. F., and Dove, W. E. (1928). The Causation of Creeping Eruption. *Journ. Amer. Med. Assoc.*, Vol. 90, p. 1701.

* Original papers not consulted.

(*Note.*—It would probably add greatly to our knowledge of the rarer parasitic worms if readers of the *Indian Medical Gazette* were to forward parasites, either from men or animals, which they do not recognise. The writer of the above article would always be pleased to receive and identify such material and to render due acknowledgment for it. If parasites are first washed by shaking in normal saline and then dropped into hot 70 per cent. alcohol, and forwarded in the latter fluid, they would almost certainly arrive in a state fit for identification.—EDITOR, *I. M. G.*)

NOTES ON THE DETECTION IN THE URINE OF SOME DRUGS USED FOR THE TREATMENT OF MALARIA.

By RICHARD GREEN, M.B., B.S.

(*From the Institute for Medical Research, Kuala Lumpur, F. M. S.*).

A. THE DETECTION OF SOME OF THE ALKALOIDS OF CINCHONA IN THE URINE.

SOME little time ago an enquiry was received by this Institute concerning the absorption from the bowel and the excretion in the urine of quinine-ethyl-carbonate (euquinine). On this occasion a child had been given treatment for malaria; "tasteless" euquinine had been employed and in view of its comparative insolubility the medical adviser wished to know whether the drug was being absorbed. In reply it was suggested that the child's urine be tested with Mayer's reagent, but it was not known how soon after administration the euquinine could be demonstrated in the urine by the reagent, the period of maximum excretion, or when the drug would cease to be demonstrable; nor was it possible to indicate the degree of variation to be expected among individuals in absorbing and excreting euquinine or any of the other derivatives of cinchona used for the treatment of malaria.

An endeavour was made, therefore, to gain some information on the points mentioned above, the conditions of the enquiry being briefly as follows:—

(*i*) The drugs chosen for investigation were quinine alkaloid, quinine sulphate, quinine hydrochloride, quinine-ethyl-carbonate (euquinine) and cinchonine; all of which have been shown by Fletcher (1923) to be effective against malarial plasmodia. These various cinchona derivatives were obtained from the British Drug Houses, London.

(*ii*) Where possible the drugs were given on each occasion to the same three cases; healthy persons of different nationalities. Case 1 was a European weighing 150 lbs., Case 2 a Chinese (128 lbs.), and Case 3 a Tamil (105 lbs.). On one occasion when quinine sulphate was investigated, Case 1-A, a Malay weighing 113 lbs., was substituted for Case 1.

(*iii*) The drugs on each occasion were given in powder form to the cases already mentioned and their administration was followed by drinking about half a pint of water. The drugs were swallowed between 8.30 and 9 a.m.; from one hour to one-and-a-half after the morning meal.

(*iv*) Following the administration of the drugs, urine was passed at intervals of twenty minutes during the first hour and subsequently every hour until retirement to sleep. The urine passed the following morning was also obtained for testing.

(*v*) It is well known that when Mayer's reagent* is added to urine containing alkaloids, a whitish opalescent cloud forms (which if due to alkaloids, disappears on heating and reappears on cooling) the density of which is generally in proportion to the amount of alkaloid present in solution. Accordingly, each specimen of urine obtained was filtered, 10 c.c. was reserved as a control and to another 10 c.c. was added fifteen drops of Mayer's reagent. If a precipitate was observed this was tabulated in accordance with its quality as dense, medium or faint, the standard of this tabulation remaining the same throughout the experiments.

* Mayer's reagent = Mercuric Chloride 6.8 grm.
Potassium Iodide 24.9 grm.
Water 500 c.c.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*vi*) This method of testing for the presence of cinchona alkaloids was adopted, as although the employment of finer methods of detection, such as those used by Ramsden, Lipkin and Whitley (1918), were considered, it was thought that simpler tests, convenient to the clinician, would be more desirable and would satisfy more closely the terms of the original enquiry concerning the use of Mayer's reagent.

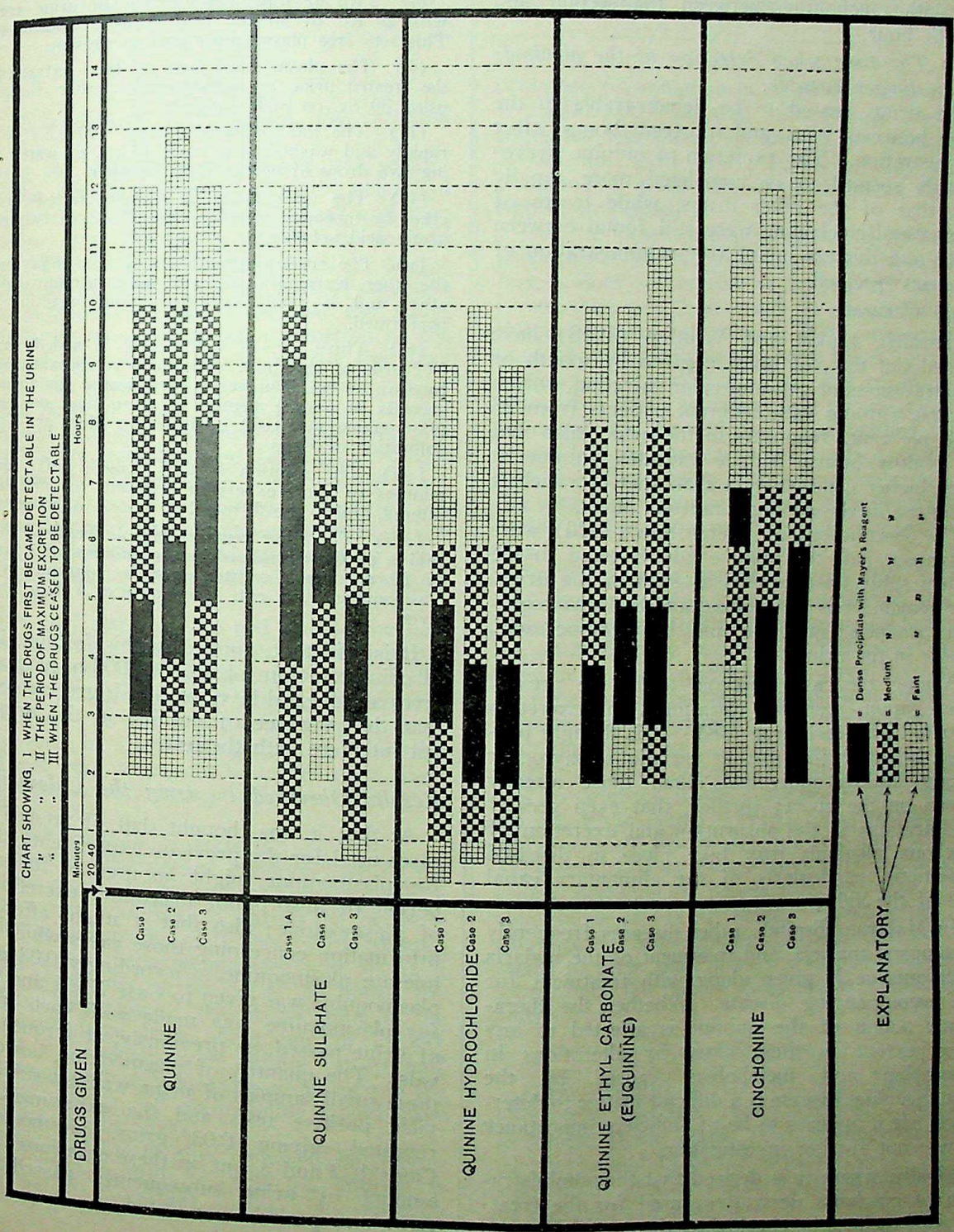
Results.

The results observed by using Mayer's reagent are shown in the following chart:—

Comments on Results Observed.

(*a*) *The time when the alkaloids first became detectable.*

With reference to quinine, euquinine and cinchonine, no reaction with Mayer's reagent was obtained until two hours after the drugs had been given. After quinine sulphate had been swallowed, it was demonstrable in the urine forty minutes, one hour, and two hours later. Quinine hydrochloride appeared to be absorbed and excreted more quickly, and in one case it was detected in the urine twenty minutes after the



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

usual five-grain dose has been given, while in the other two cases it appeared forty minutes afterwards.

(*b*) *The period of maximum excretion as estimated from the density of the precipitate.*

As with the results observed under (*a*) there was considerable variation not only as regards the drugs given, but also among cases given the same drug. With quinine alkaloid, the maximum excretion appeared to take place between the third and eight hours—with quinine sulphate, between the third and the ninth hour—quinine hydrochloride, between the second and fifth hour—euquinine, between the second and fifth hour—and with cinchonine, between the second and seventh hour.

(*c*) *The time when detection of the alkaloids was no longer possible.*

The drugs ceased to be demonstrable in the urine between nine and thirteen hours after administration. The excretion of quinine hydrochloride seemed to be completed more rapidly than that of the other drugs, while traces of quinine and cinchonine were still found between eleven and thirteen hours after administration of the doses specified.

(*d*) *General.*

Ramsden, Lipkin and Whitley (1918) have pointed out that, of quinine given by mouth or by intravenous or intramuscular injection, only a fraction, varying with different patients from 23 to 66 per cent., reappears in the urine; also that the healthy human kidney excretes quinine at much higher concentration than that at which it is present in the contemporaneous blood.

The observations of Nierenstein (1920) were that about half the quinine administered to the human subject is excreted as such in the urine. The remainder is metabolized and two disintegration products, quinitine and hæmoquinic acid, appear in the urine.

Among the cases referred to in the present investigation, certain variations in excretion occurred with each drug used. It is thought probable, however, that greater variations may occur among healthy individuals than those already shown on the chart; further, that even greater modifications in the absorption and excretion of cinchona alkaloids may take place in diseased conditions, particularly of the alimentary canal and of the kidney.

In Malayan hospitals, other diseases frequently accompany malaria, and treatment of the malaria with quinine is given along with treatment for the accompanying disease. Whether the therapeutic action of the quinine is affected to any great extent in these cases by alterations in absorption and metabolism caused by the accompanying disease is a difficult matter to determine, but it appears to be of sufficient importance to warrant further investigation.

Finally, where it is desired that the administration of cinchona derivatives used for the treatment of malaria be checked by the use of Mayer's reagent, it is hoped that the details in the chart above may afford some indication of the results to be expected and of the variations occurring among healthy individuals.

B. The Detection of Plasmoquine in the Urine.

The detection of plasmoquine in urine by the use of chloranil (tetrachloroquinone, $C_6 Cl_4 O_2$) has been described by Schulemann, Schönhöfer and Wingler (1927). The test depends on the formation of a blue dye when plasmoquine reacts with chloranil; and is carried out as follows:—

(*i*) Two or three hundred c.c. of urine are mixed with 20 c.c. of 50 per cent. caustic potash solution. This sets free plasmoquine base, if present.

(*ii*) The plasmoquine base is then extracted from the treated urine by agitation with ether three times, using 30 c.c. on each occasion.

(*iii*) The total ethereal extract (90 c.c.) is filtered rapidly and washed twice with 10 c.c. of water containing two drops of normal soda solution.

(*iv*) The plasmoquine is then extracted from the ether by thorough agitation with 6 c.c. of two per cent. acetic acid solution.

(*v*) The acetic acid solution is next separated from the ether, warmed on a water bath to remove dissolved ether and is ready for the colour reaction to be performed.

(*vi*) Three c.c. of acetic acid is added and about 0.05 grm. of chloranil. The mixture contained in a test tube of 1.6 cm. diameter is then heated for about ninety seconds in a free flame. If more than one part of plasmoquine in 50,000 is present a blue or blue-green coloration develops.

(*vii*) The solution is then cooled, left for some minutes to allow excess of chloranil to crystallize out, filtered, and to the filtrate 1 to 1.5 c.c. of ether is added.

(*viii*) The ether remains in solution until the acetic acid is partly neutralized by the addition of a few drops of 50 per cent. caustic potash solution, when, if plasmoquine is present, it separates as a deep blue upper layer.

It is said that, applied in this fashion, 100 c.c. of urine containing 1 in 2,000,000 of plasmoquine, gives an ethereal layer of bluish green colour and that the presence of quinine in the urine does not interfere with the test.

Results Observed in using the Chloranil Test.

At first it was thought that, if applied to the cases used for the previous experiments, this test for plasmoquine might be used to indicate the period of absorption, maximum excretion, etc., of plasmoquine; also that it might afford some information concerning those cases which do not tolerate plasmoquine. Accordingly 0.03 grm. of plasmoquine was given to Case No. 1 and the test for plasmoquine was made with each specimen of urine passed, as previously, at frequent intervals. The quantity of plasmoquine, however, in these small samples of urine was not sufficient to yield positive tests and the experiments were repeated, giving 0.03 grms. plasmoquine to Cases 1, 2 and 3, but on these occasions the total amount of urine subsequently passed during eight-hour periods was tested.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The following table shows the results observed:—

Case No.	Details.	Periods during which urine was collected and tested.		
		1st 8 hours	2nd 8 hours.	3rd 8 hours.
1	Quantity of urine passed	410 c.c.	215 c.c.	285 c.c.
	Result of Chloranil Test	Positive	Negative	Negative
2	Quantity of urine passed	360 c.c.	260 c.c.	160 c.c.
	Result of Chloranil Test	Positive	Negative	Negative
3	Quantity of urine passed	430 c.c.	200 c.c	315 c.c.
	Result of Chloranil Test	Positive	Negative	Negative

Comments.

(*a*) *Difficulties in carrying out the chloranil test.*

During the application of the test, the separation of the ether layer formed after the urine had been shaken up with the caustic potash and then with ether, was found to be incomplete and delayed. The first extraction seemed to be the most difficult, as an intermediate layer of emulsion was formed between the urine and the ether, this emulsion containing a fair proportion of the ether which was to be recovered for the next stage of the test. On the suggestion of a colleague, however, four or five drops of alcohol were added and this hastened considerably and rendered more complete the separation of the ether from the intermediate layer. More complete separation was also effected by carrying out the extracting and separating processes at a low temperature, accordingly each specimen of urine to be tested was given a preliminary chilling in an ice-chest.

At the final stage of the test (*viii*), the heat resulting when the acetic acid was partly neutralized with caustic soda, tended to drive off the ether layer which separated during the neutralizing process. It was found convenient to carry out this stage by surrounding the test tube with ice. There were no reasons to regard these slight modifications as interfering with the delicacy of the test.

(*b*) *Interpretation of Results.*

The dose of plasmoquine given to each of the three cases was 0.03 grm. and the average quantity of urine passed was 875 c.c. during the 24 hours following administration. If none of the plasmoquine given had been metabolized and all of it excreted evenly over a period of 24 hours, the highest concentration of the plasmoquine in the urine would have been about one in 29,000. Again if, in common with quinine, about half the plasmoquine had been excreted as such in the urine, the dilution of plasmoquine would have been about one in 58,000.

The test is said to be effective when the amount of urine used is 100 c.c. and the dilution is as high as 1 : 2,000,000, so that, in connection with the three cases reported it may be inferred that during the first eight-hour period, the urine contained plasmoquine in quantities of more than 1 : 2,000,000; but that subsequently the urine contained less than that amount or none at all. It did not seem likely, however, that all the plasmoquine given was excreted during the first eight-hour period.

On the other hand, of stated quantities of plasmoquine given by mouth to the human subject, it does not appear to be known how much is excreted and how much is metabolized. In this connection Achundow (1928), whose results have become available since the above tests were performed, found that, in a few of his cases, absorption and excretion of plasmoquine (as estimated by the chloranil test applied to the urine) did not appear to take place; and with regard to these cases, it has been suggested that the drug had undergone some change in the body which prevented the usual reaction to the chloranil test.

At the present moment it may thus be said that our knowledge of what happens to plasmoquine when ingested by the human subject is in an unsatisfactory state. The symptoms of intolerance or idiosyncrasy that have been noted in patients treated with plasmoquine may well depend on abnormalities in metabolizing and excreting the drug.

The effective dosage of plasmoquine is small and its detection in the urine is, as yet, a difficult matter, while Henry (1929) considers that possibly an even more delicate test than that of Schulemann and his colleagues is required to ensure detection of plasmoquine in urine. This test, however, as it stands, demonstrates the presence of plasmoquine in high dilution and seems to offer some prospect of advancement in ascertaining the fate of plasmoquine in the human body.

Acknowledgments.

I am indebted to Dr. A. Neave Kingsbury, Director, Institute for Medical Research, Federated Malay States, for permission to publish this paper and to Mr. J. Shelton, F.I.C., for his suggestions in connection with the performance of the chloranil test.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

REFERENCES.

Achundow, I. (1928). *Arch. f. Schiffs-u. Trop. Hyg.*, XXXII, 7, p. 347. Summary, *Trop. Dis. Bull.*, XXVI, 5, p. 375.

Fletcher, W. (1923). *Studies from the Inst. Med. Res., F. M. S.*, No. 18, pp. 13 to 23.

Henry, T. (1929). *Trop. Dis. Bull.*, XXVI, 5, p. 376.

Nierenstein, M. (1920). *The Lancet*, May 22nd, p. 1126.

Ramsden, W., Lipkin, I. Whitley, E. (1918). *Ann. Trop. Med. and Parasit.*, XII, 2, p. 223.

Schulemann, W., Schönhöfer, F., Wingler, A. (1927). *Abhandl. a. d. Gebeit d. Auslandkunde, Hamburg Univ.*, XXVI, p. 507. Summary, *Trop. Dis. Bull.*, XXV, 7, p. 568.

THE VALUE OF PREVENTIVE INOCULATION AGAINST CHOLERA.

SOME FIGURES FROM BURMA.

By G. JOLLY, C.I.E.,
LIEUTENANT-COLONEL, I.M.S.,
Officiating Director of Public Health, Burma,
J. J. G. DA COSTA, L.M.S.,
District Health Officer, Meiktila,
and
AH. SHOUNG, M.M.F.,
Assistant District Health Officer, Meiktila.

A SEVERE epidemic of cholera broke out in the Meiktila district of Burma during the year 1928. Its special interest lies in the fact that a very large proportion of the inhabitants of the infected villages were inoculated, and secondly in the fact that careful records were kept.

The epidemic began in the latter half of May and was over by about the middle of November.

The disease originated in the Mahlaing Township of the district and spread thence to all the other townships and to the municipal town of Meiktila. In the district there occurred 992 attacks and 30 in the town. The rural figures are the more interesting of the two and are of much greater importance statistically than the town figures.

The total population of Meiktila district at the last census was 281,029. In this population there were 992 attacks, giving an attack rate of 3.53, and 744 deaths, giving a death rate of 2.65.

Out of this total population, 50,096 persons were inoculated against cholera during the course of the epidemic, by single doses of one c.c. of cholera vaccine obtained from Kasauli. The 230,933 remaining persons in the district were not inoculated. The comparative figures of attacks and deaths among the non-inoculated and the inoculated persons are shown in Tables 1 and 2 below:—

TABLE I.

Non-inoculated population in the district, 230,933
Cholera attacks in above, 954. Attack rate, 4.13
Cholera deaths in above, 706. Death rate, 3.06

TABLE II.

Inoculated population in the district .. 50,096
Cholera attacks in above, 38. Attack rate, 0.76
Cholera deaths in above, 38. Death rate, 0.76

It will be observed that the attack rate among the non-inoculated population in the district is 5.43 times greater than the attack rate among the inoculated population, while the death rate among the non-inoculated is 4.03 times that among the inoculated.

Out of a total of 1,030 villages in the district of Meiktila, 152 were infected during the epidemic, containing a population of 55,011 persons out of a total population of 281,029 contained in the district. This therefore was the population exposed to infection and among whom infection did actually occur, and it is interesting therefore to note in detail the statistics of the attacks and deaths among this population, comparing the figures for the non-inoculated with those for the inoculated.

Among this population of 55,011, there were 992 attacks of cholera, giving an attack rate of 18.03 and 744 deaths, giving a death rate of 13.52.

Of the 55,011 persons living in the infected villages, considerably more than half, namely 32,450, were inoculated, being a percentage of 58.99. Tables 3 and 4 below give the attacks and deaths with their rates among the non-inoculated population and among the inoculated:—

TABLE III.

Infected villages.

Non-inoculated population 22,561
Cholera attacks in above 954. Attack rate, 42.29
Cholera deaths in above, 706. Death rate, 31.29

TABLE IV.

Infected villages.

Inoculated population 32,450
Cholera attacks in above 38. Attack rate, 1.17
Cholera deaths in above 38. Death rate, 1.17

It will be observed that the attack rate in the non-inoculated population of the infected villages is 36.15 times greater than the attack rate in the inoculated population of these villages. It will also be noted that the death rate among the non-inoculated population is 26.74 greater than that among the inoculated.

The fact that the ratio of the attack rate among the non-inoculated to that among the inoculated is greater than the corresponding ratio of deaths is due to the circumstance that out of 38 attacks which occurred among the inoculated population of the infected villages all proved fatal. This point is illustrated in Tables V and VI which show the percentage of deaths to attacks of 74 among the non-inoculated compared with 100 per cent. among the inoculated.

TABLE V.

Infected villages.

Non-inoculated population 22,561
Cholera attacks in above 954
Cholera deaths in above 706
Percentage of deaths to attacks .. 74.00

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE VI.

Infected villages.

Inoculated population	32,450
Cholera attacks in above	38
Cholera deaths in above	38
Percentage of deaths to attacks ..	100.00

Both in the case of the non-inoculated and in that of the inoculated, the percentage of deaths to attacks is very high, and, as will be shown later, is much higher than the similar figures in the town of Meiktila. This high percentage of deaths to attacks may be due to the fact that the great majority of these cases occurred in remote villages, and that in few instances were the services of a trained medical man available for treatment during the attack.

The 100 per cent. mortality among the 38 cases occurring in the inoculated population of the in-infected villages would, however, appear to indicate something more than mere lack of skilled medical aid, because, although the figures are small and therefore relatively insignificant statistically, it is nevertheless unusual to find even among so small a group of cases of cholera a cent. per cent. mortality. There is, however, another possible explanation. When we analyse these 38 deaths among the inoculated population, we find that in each case the attack of cholera began before the end of the fifth day following preventive inoculation. In no instance during the whole epidemic was any person who had been inoculated attacked by cholera later than the fifth day following inoculation. The actual figures are given in Table VII below:—

TABLE VII.

Inoculated population in infected villages ..	32,450
Cholera attacks on 1st day of inoculation ..	10
" " " 2nd " " " ..	7
" " " 3rd " " " ..	5
" " " 4th " " " ..	4
" " " 5th " " " ..	12
" " after 5th " " " ..	nil
Total cholera attacks in above population ..	38

A possible explanation for the 100 per cent. mortality among these 38 cases is the negative phase which follows upon an injection of vaccine. The figures suggest that the positive phase does not become established until after the 5th day following inoculation. On the other hand, some mild cases following inoculation may have been missed.

In Meiktila town, with a population of 7,231 (excluding the Cantonment) there were during the epidemic period 30 attacks of cholera giving an attack rate of 4.15, and 12 deaths giving a death rate of 1.66. Tables VIII and IX show the attacks and deaths with their rates among the non-inoculated population and the inoculated population respectively:—

TABLE VIII.

Non-inoculated population	2,360
Cholera attacks in above, 30. Attack rate,	12.71
Cholera deaths in above, 12. Death rate,	5.08

TABLE IX.

Inoculated population	4,871
Cholera attacks in above	nil
Cholera deaths in above	nil

In comparison with the rural figure (Table V) in Meiktila town the percentage of deaths to attacks among non-inoculated was 40. The relatively lower death rate in the town was unquestionably due to the existence of a district hospital and the presence of skilled medical attendance.

EPIDEMIC JAUNDICE (WEIL'S DISEASE) OR MALARIA IN KANDI SUBDIVISION OF MURSHIDABAD DISTRICT IN 1928.

By S. N. SUR, M.B., D.P.H., D.T.M.,
Assistant Director of Public Health, Malaria Research, Bengal,
and
HARIPADA SARKAR, L.M.S., D.P.H.,
Assistant to the Assistant Director of Public Health, Malaria Research, Bengal.

IN October 1928, Mr. S. C. Singha of Panchthupi village of Kandi Subdivision stated in a letter addressed to the senior writer that "in the subdivision of Kandi a new malady has been in evidence; it is like epidemic jaundice." On asking particulars from him as to the place of occurrence of such cases he informed me that the medical officer of the local S. S. Charitable Dispensary cured all the three cases which had come under his treatment. "Several other cases were treated by various other medical practitioners of the locality. The largest number of cases, some of which proved fatal, occurred at and about Kandi. Malaria is less in evidence this year owing, I think, to the excess in rainfall. The cases of jaundice have cropped up during the break which has continued since the middle of August."

The junior author of this paper was deputed to investigate the matter in the same month. He called on the Assistant Surgeon-in-charge of the Kandi Charitable Dispensary and three other private medical practitioners of the town. No acute cases of jaundice were available at the time and most of the cases that had suffered from jaundice had got over the trouble, while only one old woman had died. The history of the attack was taken of the three cases who still showed signs of jaundice, e.g., slight yellow tinged conjunctivæ, etc. The attack started with slight fever and pain all over the body in general, about three weeks before the visit, and there was no history of epistaxis or hæmoptysis or purpura. One of the patients only had a tender and enlarged liver, while all of them had enlarged spleen and one only had slightly injected conjunctivæ. Both urine and blood films were examined in all the three cases.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Their condition at the time of investigation is shown below in the table:—

Cases.	Caste.	Age.	Sex.	Conjunctivæ injected.	Hæmoptysis.	Epistaxis.	Limb pains.	Enlarged liver.	Enlarged spleen.	Jaundice.	Albumen.	Epithelial cells and casts.	Acetic Acid Test*.	Phosphates.	Blood for malarial parasite.	Type of malarial parasite.
1-K	Muhammadan	20	M	—	—	—	++	—	++	++	—	—	—	++	—	
2-0	Hindu	38	M	—	—	—	++	+	++	++	—	—	—	+	++	B. T. (all stages).
3-8	Hindu	16	M	—	—	—	+	—	+	+	—	—	—	+	++	Do.

* "Acetic Acid Test"—"The urine of a case of Weil's disease from the 5th to 8th day is said to give an intense green reaction when one or two drops of acetic acid are added to about one inch of the urine in a test tube."—(Manson-Bahr).

The "acetic acid test" as noted above in all the cases gave negative results. In addition to the ordinary chemical tests of the three samples of urine, bacteriological examination was also made in the following manner. They were centrifuged and the deposite injected intra-peritoneally into three guinea-pigs. The guinea-pigs did not develop any symptoms and continued to be quite healthy for over one month, and their blood did not show any *Leptospira icterohæmorrhagiæ* (the causative organism of Weil's disease) under dark-ground illumination.

Blood films of all three cases that suffered from jaundice were examined. Two of them showed heavy infection with benign tertian malaria parasites, while one was negative (*vide* table above). The person whose blood was negative for malaria parasites had been taking quinine during the visit. From the above results it seems clear that all the cases of jaundice were possibly of malarial origin and not due to Weil's disease. Castellani and Chalmers mention a type of "a typical subtertian malaria" which simulates "yellow fever" and "Weil's disease" (*vide* Castellani and Chalmers, 3rd Edition, page 1172). These authors mention malarial jaundice being caused by malignant tertian infection. But at Kandi this type of jaundice was apparently excited by benign tertian infection also, as both the positive cases showed benign tertian parasites in all stages of development.

That this area is a hyperendemic area is shown by random sampling of blood films from the inhabitants of that village. Altogether 11 films were examined, of which 8 were positive for malaria parasites as shown in the table below:—

Case.	Caste.	Age.	Sex.	Type of malaria parasite.
1-B.	Hindu	6	Male	.. *Nil.*
2-J.	Muhammadan	3	Female	+ + B.T. (all stages).
3-O.	Hindu	30	Female	+ + M.T. rings.
4-U.	Hindu	11	Female	+ + + Quartan & M.T. rings.
5-I.	Muhammadan	8	Male	+ + M.T. rings.
6-B.	Hindu	40	Male	.. *Nil.*
7-S.	Hindu	30	Female	+ + M.T. rings.
8-Sr.	Muhammadan	3	Female	+ M.T. rings.
9-K.	Hindu	35	Female	.. *Nil.*
10-H.	Muhammadan	6	Male	+ + B.T. (all stages).
11-B.	Hindu	14	Male	+ M.T. rings.

Malignant tertian parasites were found in 6, benign tertian parasites in 2, and quartan in 1. Malignant tertian was therefore the most prevalent species during the month of October at Kandi.

There is thus little doubt that the reported cases of jaundice were due to the heavy infection with malarial parasites. There was no evidence of spirochætosis. The writers are therefore of opinion that the epidemic jaundice referred to by Mr. Singha was of malarial origin and not due to Weil's disease.

THE INFECTIOUSNESS OF LEPROSY.*

By E. MUIR, M.D., F.R.C.S. (Edin.),
School of Tropical Medicine and Hygiene, Calcutta.

FROM ancient times leprosy was held to be infectious. The best known proof of this is the stringent rules imposed in the Mosaic Law for the isolation of lepers. Yet the disease described in the Bible was probably not only leprosy as we know it to-day but also included a multiplicity of scaly skin diseases such as various forms of tinea and possibly syphilis and yaws.

The laws imposed in the middle ages in England and throughout Europe show the common belief that leprosy is spread from the infected to the healthy by contact, and it was largely due to this belief that the incidence of leprosy diminished and the disease had almost died out of England by the end of the 16th century.

In the 17th century unfamiliarity with leprosy and new teaching with regard to heredity swayed

* Being a paper read at the meeting of the Calcutta branch of the British Medical Association on Friday, 9th August, 1929.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

public and medical opinion to the ideas that leprosy is hereditary, and this belief was largely held in Europe till near the end of the 19th century. In 1862 a report of the Royal College of Physicians of London, prepared by a special committee, supported this theory; and even in the beginning of the 20th century so great an authority as Jonathan Hutchinson opposed the teaching that leprosy is spread by contagion. But since the discovery of Hansen's bacillus in 1872 the belief has gradually grown stronger that the disease is caused by this organism and that *contact* is the chief factor controlling its spread. The discovery that malaria, yellow fever and filariasis are carried by mosquitoes, that plague is carried by fleas and that other diseases are spread by other insects, lead to the question whether leprosy was not also spread in this way. Lebouf by means of his own experiments and by summarizing the literature on the subject has shown that, though house-flies may carry lepra bacilli in their gut after feeding on infectious ulcers and deposit the same on the mucous surface of the nose or on the raw wounds of healthy persons, yet evidence is lacking that biting insects are at all an important factor in carrying the disease.

The return of the swing of the pendulum in favour of contagion led to renewed energy in the direction of isolating lepers in asylums and colonies, and large numbers of these institutions were founded in the end of the 19th and the beginning of the 20th centuries. The public subscribed to these and Government expended money on them, largely under the impression that by isolating lepers the spread of the infection would be limited. But little endeavour was made to ascertain whether the cases isolated were the most infectious and dangerous ones or not.

The questions now to be considered are:—

(1) Is leprosy infectious or contagious, and if so to what extent?

(2) In what stages, types and phases is it most infectious?

(3) What are the best means to be taken in a country like India to prevent the spread of infection?

(1) There is abundant evidence to show that leprosy is spread from the infected to the healthy by direct contagion and that children are more liable to infection than adults. While children removed from infectious parents at birth practically never develop the disease, those brought up by a highly infectious mother seldom escape infection, a whole family of 5 or 6 children acquiring the disease from a parent or elder brother or sister: 40 to 50 per cent. of children are said to acquire the disease if not removed from leprous parents. If this is so probably 100 per cent. are infected in some instances, i.e., when parents are highly infectious; as a certain proportion of the parents are not infectious at all, and this number has to be deducted. On the other hand, conjugal infection (the husband infecting the wife and the wife the husband) is comparatively uncommon, being given variously as 2 to 5 per cent.

The factors which determine the chance of infection are:—

(*a*) The closeness of contact. Progressively dangerous we have: village infection, house infection, room infection, bed infection. The closer the contact the more likely is the disease to be transmitted.

(*b*) The length of contact: the longer the contact the more likely is leprosy to be acquired.

(*c*) The infectiousness of the leper: in certain types, stages and phases of the disease leprosy is much more infectious than in others.

(*d*) The general resistance of the person in contact. This is a very important factor that has not been sufficiently realized in the past. Condemned criminals have been inoculated with suspensions of human tissues containing large numbers of Hansen's bacilli and some of these have failed to develop leprosy. It has been argued from this that leprosy is not spread by direct inoculation. The probable explanation is either that the particular bacilli inoculated were dead or, what is more likely, that the resistance of those inoculated was sufficient to prevent the development of the disease.

The resistance of the patient may be lowered by various factors:—

(*a*) Various diseases have this effect. The most common predisposing diseases in India are syphilis, malaria, helminthic infections, streptococcal infections, dysenteries and kala-azar; but in fact almost any disease may have this effect. There are various slight and exceedingly chronic infections of various kinds which cause little or no signs and would probably not be detected in the usual course, but which are detected when special examinations are made of leprous patients. These inconspicuous infections are able to act as important predisposing causes and their removal often results in the rapid improvement of leprous lesions. Thus serological examination shows the presence of syphilis in many cases where this disease was unsuspected. Chronic dysenteric infections and pyorrhœa are often brought to light only when examined for as possible causes of lowered resistance in leprosy.

(*b*) Besides these various diseases there are many other factors which lower the resistance of the body. These have been brought out clearly by the work of the leprosy survey party of the British Empire Leprosy Relief Association in several of the provinces and states of India. It has been found that generally speaking leprosy is most common among semi-aboriginal, low caste Hindus. The aboriginal such as the Sonthal, living a healthy life in the jungle, mixing only with members of his own or similar tribes and his life regulated by simple but wise tribal rules, escapes the disease. When he begins to leave his primitive life and mix with other castes he becomes subject to leprosy in proportion to the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

degree of mixing that takes place and the consequent abandonment of his old tribal customs. Thus the survey party divide villages into three types: those where there is only one caste; those in which there is more than one caste but the castes live in separate quarters of the village; and those in which the various castes are mixed and not separated into quarters. In the first, leprosy is invariably most scarce, in the second more common, and in the third most common of all. The reason for this is that special tribal or caste rules are more lax where more mixing takes place; and promiscuity—sexual, sartorial and social—become common, resulting in venereal and other diseases; and as there is closer contact there is more chance of spreading the disease. Low caste servants are often employed in Brahmins' houses and convey leprosy to the high caste children that they tend.

Another important factor is the precariousness of food supplies in regions where famine is frequent, due to meteorological and geographical conditions; famine generally being the result of a failure of the monsoon. The Bankura district is a conspicuous instance of this and the famine also frequently drives the inhabitants to seek work and substance in more fertile regions; in this way they carry leprosy to non-endemic areas. Leprosy is being spread at the present time owing to such causes in the Maldah, Rajshahi and many other districts of Bengal.

(2) In what stages, types and phases is leprosy most infectious?

Another very important point to be considered is the relative infectiousness of the various types, stages and phases of leprosy. Without going into details of the pathology of leprosy it is sufficient to give a brief sketch of the course of the disease.

Leprosy can generally be diagnosed with certainty from clinical signs long before it is possible to find Hansen's bacilli in smears or sections. The lesions first noticed are chiefly skin patches which vary from a quarter inch to several inches in diameter when first noticed and may be depigmented and whitish or erythematous. They generally show keratosis, stunting or destruction of hair, and anhydrosis. They show various changes in sensation such as deep analgesia, loss of heat and cold sensation, paræsthesia and loss of epicritic sensation or superficial anæsthesia. The more marked the last symptom is, the greater is the thickening of the sensory nerve branches supplying the area and the less chance is there of finding Hansen's bacilli in the lesion.

Occasionally the first early sign of leprosy is thickening of nerve trunks without any apparent corresponding skin lesions.

In the second stage in a typical case of leprosy (B 2 or B 3) bacilli can be found in ever increasing numbers, until a smear taken from any skin lesion or from the mucous membrane of the nose contains millions of acid-fast bacilli in every field of the slide.

In the third stage (A 2) the bacilli begin to diminish again, leaving deformities of the hands, feet and face.

In some types in which the resistance is fairly high, a small anæsthetic skin lesion (A 1) may persist for years without increasing in size. Sections of such an area fail to show Hansen's bacillus and yet, if that patient's resistance is lowered by any intercurrent disease or other cause, the edge of the patch may begin to extend, becoming at the same time slightly raised, and later a few bacilli may be found in the margin. On the other hand, if the patient's resistance is not lowered and treatment is given, the patch may be expected to disappear entirely. Whether a patient should be considered a danger to the community if he has a patch which is undoubtedly leprous, but in which sections examined by an expert fail to show Hansen's bacillus, and whether he should lose his employment on that account are the main questions under consideration in this paper. There are no bacilli circulating in the body and being excreted in the sputum, fæces, urine or nasal secretion; all these are negative in such a case. The bacilli are confined to the skin lesion and possibly to the branches of the neighbouring cutaneous nerves. They are so few in number that search with infinite care fails to show them, and those that actually exist are separated from the surface by the epithelial covering of the skin. In order that such a patient should infect anyone else one or more of the infinitesimal number of bacilli has to find its way out of the skin through the epithelium, find its way into another person through his skin or mucous membrane and there meet with a suitable soil in which to grow. The chances of such an occurrence are not one in a billion, and the danger is absolutely negligible.

Even when a few bacilli can be found after much search in such a lesion the danger of infection is practically nil, and yet it is well that (erring if at all on the safe side) such a patient leave his work until the bacteriological examination becomes negative.

(3) What are the best means to be taken in a country like India to prevent the spread of infection?

My experience leads me to recommend as perfectly safe the rule that the line of isolation be drawn not between the clinically positive and the clinically negative cases, but between the bacteriologically positive and bacteriologically negative cases.

This means that all cases which are in the stage which though clinically positive is bacteriologically negative, a stage of the disease which may last for months and even years, should be allowed to continue their work, mixing freely with others. This, however, should be allowed only provided that they continue under efficient,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

regular treatment until all active clinical signs have been absent for some considerable time, and remain under medical observation for two years after treatment is stopped.

The importance of adopting this attitude, instead of ostracizing bacteriologically negative though clinically positive cases by removing them from their work is that, patients will be attracted to take treatment in the early stage and to stick to the treatment regularly and conscientiously, instead of doing their utmost to hide the disease until it has passed on to the second stage which is more difficult to treat and in which they are a danger to their families and neighbours. It is obvious that the former instance is much less likely to spread the disease than the latter.

Yet so strong is the prejudice against leprosy that there are still some employers who will cast out their employees when they hear that they have leprosy, although they are advised that they are in the early, non-infectious stage and that they are not a danger to others. On the other hand, there are numbers of clerks, peons and other employees to-day in Calcutta who were formerly under our treatment for leprosy and whose recovery is largely due to the fact that their employers took our advice and continued to employ them, thus providing a means of maintaining themselves during the prolonged period of treatment.

The early diagnosis and treatment of leprosy is undoubtedly the most hopeful method of dealing with the disease, but it is impossible to carry this out to any large extent unless clinically positive but bacteriologically negative cases are counted as non-infectious.

With regard to bacteriologically positive cases we find them in all stages of infectivity. It is those of them who discharge Hansen's bacilli from the nose that must be looked upon as specially dangerous to the public, also those with ulcerating nodules—as opposed to trophic ulcers which are not as a rule infectious. Examination of the surface of the epithelium when it is not ulcerating seldom shows Hansen's bacillus. Speaking generally a patient's infectivity may be judged by the number of bacilli which are discharged from the nose, seeing that almost all patients who have skin lesions in which there are many bacilli and who are at all likely to spread infection, have at the same time a marked lesion of the nasal mucosa. When such a case is healing up under treatment we generally find that by the time the nose becomes bacteriologically negative there are very few bacilli to be found in the skin. In fact I believe that if we could eliminate the infection caused by patients with nasal infection, we should practically have eliminated all infection; but though this may be true I believe in leaving a considerable margin of safety and, except in employments in which the patient does not come in contact with others or touch things which have later to be touched by others, I recommend that employment be stopped until the patient becomes bacteriologically negative.

From the point of view of employment we can therefore divide patients into three groups:—

(1) *Those who, though clinically positive, are bacteriologically negative.* They should be allowed to continue their work provided they place themselves under regular, efficient treatment, reports of their progress being asked for and sent to their employers by the doctor from time to time, so as to ensure that they do not neglect treatment and that they are continuing to make satisfactory improvement.

(2) *Patients whose skin is bacteriologically positive to a slight degree, only a few acid-fast bacilli being found with difficulty, and the nose bacteriologically negative.* Such patients should, if possible, be allowed to go on leave, still drawing their pay. In many cases six months' treatment will render them bacteriologically negative, when they can be allowed to return to work still carrying on treatment as long as is necessary. The same periodical reports should be asked for and sent to the employer.

(3) *Patients in whose skin there are larger numbers of acid-fast bacilli and especially those whose nasal mucosa is bacteriologically positive.* If such patients have earned a considerable amount of leave, say one or two years, it may be possible in some cases for them to be rendered non-infective before the leave expires; but in many cases this will not be possible. The extent to which employers can be held liable for maintenance of such patients during their term of treatment is a matter for consideration. Some employers we have found very generous, others the reverse.

If some such classification as the above were generally accepted and acted upon it would tend to have three effects:—

(1) Employers would be more likely to insist on medical examinations of their employees with a view to finding out if leprosy is present or not.

(2) Employees would come forward more readily for diagnosis and treatment and not try to hide their lesions as long as possible for fear of losing their employment. Thereby they would ensure their own recovery, being treated in the early, highly remediable stage; and the danger of the spread of infection to their fellow workers would be lessened.

(3) The knowledge that there was danger of losing their employment would act as an incentive to the patients to do their utmost to get better quickly—a very important factor in speeding up improvement.

The present indiscriminating ostracism of all cases of leprosy which still holds good in some quarters has the opposite effects, patients doing their utmost to remain concealed. Such concealed lepers are often, it is easily understood, the most dangerous of all infection carriers.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

OBSERVATIONS ON A SERIES OF BACTERIOLOGICAL EXAMINATIONS OF TUBE WELL WATER IN RANGOON.

By MILITARY ASSISTANT SURGEON G. MACKEY, D.T.M., I.M.D.,

Assistant Director, The Harcourt Butler Institute of Public Health, Rangoon,

and

G. G. JOLLY, C.I.E., M.B., Ch.B., D.P.H., D.T.M. & H., LIEUTENANT-COLONEL, I.M.S.,

Director of Public Health, Burma.

THE general opinion of tube well water when judging its quality from a bacteriological point of view is that it is usually very pure and above suspicion.

Support is given to this opinion by the facts that:—

(1) A physical examination shows the water to possess the qualities required of a good water in so far as appearance, taste, smell, etc., are concerned.

(2) The source of the water lies far below the surface and is therefore, one would imagine, beyond the limits of penetration of organisms associated with soil and surface supplies.

From results obtained from examinations of tube well water carried out at the Harcourt Butler Institute at different periods of the year, it was found that the quality varies and does not always come up to the high standard of purity which it is supposed to possess. With a view to determining to what extent this is the case, a series of examinations, extending over a period of 10 months and covering 6 months of the wet and 4 months of the dry season, were carried out.

Rangoon with its numerous tube wells, which are used to supplement the Hlawga Lake supply, lends itself admirably to a piece of work of this nature, and the bulk of the samples examined were collected from two tube wells, possessing a high reputation for the excellent quality of their water, and which have been in daily use for a number of years.

The results of examinations of samples of water collected during the period 1st November 1927 to 28th February 1928, both in this and previous work, showed that tube well water certainly does during the dry months of the year uphold its reputation for purity; in fact one may go a step further and describe it as practically sterile, if absence of lactose-fermenting organisms in 100 c.c. of water and a negligible total count may be regarded as significant of this.

Owing to this dry season sterility it will be clear that a study of the bacterial flora of tube well water in Rangoon, can only be made during the wet months of the year, i.e., 15th May to 31st October, when the presence of lactose-fermenting organisms has on occasions been detected in 1 c.c. of water.

These observations were commenced on the 1st May 1927, about a fortnight before the rains broke, and it was intended in the first instance to record the results of a daily examination of water from the tube well supplying the Central Jail in so far as the presence or absence of lactose-fermenting organisms and the total count in 1 c.c. on agar were concerned. This water was examined daily from the 1st May 1927 to the 28th February 1928 with a break of 2½ weeks from 17th June to 3rd July 1927.

In the period from August 1st to 31st October, water from the Jail tube well and from the tube wells of the Rangoon Foundry and Windermere Park, as well as from some others, was examined. The observations during this period were further extended to determine the ability or otherwise of the lactose-fermenting organisms present to utilise citrate, and in the latter case further tests with a view to identification were carried out.

From 1st November 1927 to 28th February 1928 the results recorded showed an entire absence of lactose-fermenting organisms in 100 c.c. of water with a total count of less than 10 organisms per c.c.

The observations therefore fall naturally into three periods:—

(1) The period from 1st May to 31st July 1927, during which 74 examinations of the Jail supply were made; the presence or the absence of lactose-fermenting organisms and the total count in 1 c.c. on agar only being recorded.

(2) The period from 1st August to 31st October 1927, during which 119 examinations of samples of water from the jail supply and additional sources were carried out, the following determinations being made.

(*a*) The presence or absence of lactose-fermenting organisms.

(*b*) Their capability when present of utilising citrate or otherwise.

(*c*) Their identification when non-citrate utilisers.

(*d*) The total count in 1 c.c. on agar.

(3) The period from 1st November 1927 to 28th February 1928, during which 85 samples were examined. The results of these examinations consistently showed lactose-fermenting organisms absent in 100 c.c. with a negligible total count, so no further remarks with regard to this section are necessary, beyond stating that the period covered is the dry season of the year.

Period (1). A summary of the results of the 74 examinations carried out is as follows:—

Samples showing absence of lactose-fermenting organisms in 100 c.c. ..	55
Samples showing presence in 100 c.c.	14
Samples showing presence in 10 c.c.	3
Samples showing presence in 1 c.c.	2

The Total Count.—The reading of the total count in 1 c.c. on agar was never above 100 colonies, and in the majority of examinations was below 10 colonies per c.c..

The above tests being presumptive, it was impossible to give an opinion one way or the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

other as to the quality of the water, especially as the presence of lactose-fermenting organisms even in 1 c.c. of water was always associated with a low total count. For this reason it was necessary to proceed further with the examination of these lactose-fermenting organisms and determine their nature and origin.

The most interesting feature, however, about these results was that they served to show that rainfall was followed by the presence of lactose-fermenting organisms in the water. For instance from 1st May to 12th May the reading of the results was recorded as "lactose-fermenting organisms absent in 100 c.c." The reading on 13th May, after a fall of 2½ inches of rain on 12th May, was "lactose-fermenting organisms present in 10 c.c.," followed the day after on examination of a sample collected on the 14th, by a reading of "lactose-fermenting organisms present in 1 c.c." The behaviour of this tube well water is similar to that of any surface water after a heavy shower of rain preceded by a period of dry weather. The effect of rainfall on the quality of the water in so far as the presence or absence of lactose-fermenting organisms is concerned was a noticeable feature observed during the rainy season. This observation is being recorded as an interesting finding without any present attempt to explain it.

Period (2). The results of the 119 examinations are summarised as follows:—

Lactose-fermenting organisms absent in 100 c.c.	72
lactose-fermenting organisms present in 100 c.c.	29
lactose-fermenting organisms present in 10 c.c.	12
lactose-fermenting organisms present in 1 c.c.	6

Ten lactose-fermenting colonies isolated from the MacConkey's broth tube showing the presence of acid and gas in the smallest quantity of water were inoculated into citrate media and gave the following results:—

In 42 samples, organisms capable of utilising citrate were found.

In 5 samples, organisms incapable of utilising citrate were found, and these on further examination were identified as follows:—

B. neapolitanus	2
Bacillus No. 74	2
Bacillus of the Grunthal group ..	1

Total count in 1 c.c. on agar.—In 6 samples out of 119 examined the reading of the total count was "innumerable," and in four of these the high count was due to the presence of *B. pyocyaneus*. The count in the remaining samples, including those where lactose-fermenting organisms were found in 10 and 1 c.c. of water, was below 100 organisms per c.c. *B. pyocyaneus* was also isolated in 6 other samples, making a total of ten, distributed among three tube well supplies.

The points of interest in the above results were:—

(1) The continuance of the feature already cited as regards the presence of lactose-fermenting organisms and their association with rainfall.

(2) The isolation of *B. pyocyaneus* from ten samples.

Opinions regarding the sanitary significance of *B. pyocyaneus* when found in water supplies, vary. It has been referred to by various authorities as pathogenic and is often found in pathological conditions in man. It has on more than one occasion been implicated in a dysentery-like outbreak which was water borne.

Thresh and Beale(1) record a serious outbreak of epidemic diarrhœa in the borough of Chelmsford; also one of dysenteric diarrhœa reported by the New York Board of Health, both of which were attributed to the presence of *B. pyocyaneus* in the water supply. They further state "They are chromogenic organisms found in blue and green pus and their presence in water is a certain sign of some dangerous source of pollution, since they never occur in natural waters."

Greer, Tonney and Nyhan(2) are of opinion that "*B. pyocyaneus* may or may not be pathogenic when ingested, but its presence in water should not be ignored." In their experience it is usually associated with *B. coli*. This fact, combined with its potential infective properties, should condemn a water from which it is isolated.

Adams(3) in his review of a pyocyaneus-like organism found in water concludes that its presence is not desirable, but that there is considerable doubt as to its pathogenicity.

Conclusions.

1. Tube well water in Rangoon during the dry months has been found to be of a very high standard of bacteriological purity.

2. During the monsoon, though lactose-fermenting organisms are present, they are generally citrate utilisers of non-animal origin, and are usually associated with a low total count, and bacteriologically therefore the water is usually above suspicion.

3. The sanitary significance of the presence of *B. pyocyaneus* in water supplies is still a debatable point, and whether its presence can be ignored is a question of some importance. Its presence in tube well water, however, may have a totally different significance to that of its association with surface waters, and more work in this connection will have to be carried out before any opinion as to the importance or otherwise of this finding can be given.

4. Rainfall does to a very noticeable extent affect the condition of the water in so far as presence of lactose-fermenting organisms is concerned.

References.

(1) Thresh and Beale. *The Examination of Water and Water Supplies.* Thresh and Beale. 3rd Edition.

(2) Greer. Tonney and Nyhan (1928). *Journ. Infect. Dis.*, Vol. 42, No. 6, June.

(3) Adams (1927). *The Medical Officer*, XXXVII, p. 167.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PLASMOCHIN COMPOSITUM IN THE TREATMENT OF MALARIA.*

By P. V. KARAMCHANDANI,
CAPTAIN, I.M.S.,
Indian Military Hospital, Quetta.

It has been shown by numerous observers that plasmochin combined with quinine is far more effective in subtertian malaria than quinine alone. In the present paper I propose to offer a rational explanation for these observed facts, and to quote further cases in support of these observations.

That quinine has very little effect, if any, in destroying the crescentic gametocytes of *P. falciparum* is universally accepted at the present day. Dr. Manson-Bahr of the London School of Hygiene and Tropical Medicine has stated that it actually "encourages the formation of crescents"† (*Lancet*, 7th January, 1928, p. 25.) I have also observed the same fact as in the case of Nursing Orderly Kidar Singh, quoted in a former paper (*Indian Med. Gaz.*, May, 1928), in whose blood parasites were found after he had taken 510 grains of quinine sulphate. Plasmochin, on the other hand has a selective action on crescents—the most resistant forms of the malaria parasites—a fact noted by many workers, including Dr. Manson-Bahr. Recently, however, I have had a case in which crescents persisted in spite of the patient being on full doses of plasmochin. This appeared paradoxical at first, but when I combined plasmochin with quinine in minimal doses (plasmochin 0.02 gm. with quinine sulphate 0.25 gm. t.d.s.) I discovered that the crescents rapidly disappeared from the blood stream. This led me to conclude that the crescents found, when the patient was on plasmochin only, had developed from early trophozoite forms which the plasmochin had left unaffected; but that when quinine was added to the plasmochin, it destroyed these early forms, so that crescents did not develop when the patient was taking both drugs. The paramount effect of plasmochin in destroying the crescents after they were formed, remained unaffected. It follows from the above that (1) the action of plasmochin and quinine in combination is synergic, and (2) plasmochin compositum is quite effective in subminimial therapeutic doses.

Dr. Oswald Urchs, M.D., the medical adviser to Messrs. Havero Trading Company Ltd., in the correspondence columns of the *Indian Medical Gazette*, September 1928, p. 551, stated that the effective part of plasmoquine preparation is "N-diæthyl-amino—isopentyl—8—amino—6—methoxychinolin." This complicated structure of plasmochin places it in the category of chemotherapeutic agents. According to Ehrlich these substances possess haptophoric and toxophoric groups. The haptophoric groups attach themselves to chemo-receptor groups in the parasites by chemical affinity, while the toxophoric groups have a lethal action on the parasites.

At the present day the sterilizing action of even quinine on malaria parasites is questioned and some observers assign an explanation based on phagocytosis (Gerguson, *Clinical Medicine and Surgery*, August, 1927). Whatever the real fact may be, it is admitted that large doses of quinine cause leucopænia, whereas small doses (gr. 3 to 4 t.d.s.) have no such action, even in combination with plasmochin. This has been well illustrated in my previous paper.

Further, quinine in small doses is a stimulant. By combining plasmochin with quinine we forge a weapon which not only assails the parasites from different points of attack—a combination of two therapeutic substances at the same time—but also the tonic effect of quinine in small doses stimulates the vital functions in the body—a fundamental principle in the field of therapeutics. Professor Bernard Nocht in his lecture given at the International Continuation Course in Public Health on the 28th November, 1927, stated that parasitotoxic action is greatly enhanced by the combined use of different chemotherapeutic substances, and so plasmochin plus quinine has the maximum effect in subtertian malaria. The *sine qua non* of success in therapeutics is (1) the annihilation of the enemy numbers, (2) destruction of their lethal properties, (3) augmentation of friendly resources. All of these equally important factors for success are provided by this combination of plasmochin and quinine, in that plasmochin has a destructive action on crescents, whilst quinine destroys the trophozoites. Further, quinine being tonic in small doses not only increases the phagocytic power of the blood, but by stimulating the liver and other excretory organs eliminates and destroys the toxic products. This in my opinion is the rational explanation of the superiority of plasmochin compositum over either of these drugs alone.

The only argument against the use of plasmochin brought forward by some observers are the untoward effects which may appear in the following forms:—

(1) Epigastric pain.
(2) Cyanosis and,
(3) Methæmoglobinæmia

of which the last named two may be alarming. During my last three years experience with this drug, I have come across only one case of intolerance. The dose in which plasmochin has

* Published by permission of the Director of Medical Services, India.

† It is universally admitted that quinine has no destructive action on the gametocytes of *P. falciparum;* whilst several authors have claimed that it actually stimulates crescent production; the most important paper in this connection being that by Clark (1927). *Amer. Jour. Trop. Med.*, VII, 15.

There is the possibility of a fallacy here, however Sinton has shown that the output of crescents bears a distinct relationship to the asexual schizogony cycle; reaching its maximum some ten days after the maximum output of merozoites. If, now, quinine be administered during the schizogony period, the swarm of crescents will appear ten days later, and this may be attributed to the quinine administration; whereas it seems more probable that quinine does not prevent, but does not especially favour, crescent production.—EDITOR, *I. M. G.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

been administered by me has never exceeded 0.02 gm. t.i.d. and in almost all cases I have given it in combination with quinine. I am of opinion that the combination of plasmochin with quinine mitigates in most cases the toxic effects. Plasmochin is a vaso-constrictor, whereas quinine is a vaso-dilator, and the combination of both therefore counteracts the toxicity of each. Further, as suggested by Manson-Bahr (*Lancet*. 8th September 1928), the addition of glucose in 1-oz. doses does away with all the toxic ill effects. As regards the epigastric pain this can be prevented or its evil effects mitigated by taking the drug after meals.

I append notes with temperature charts on the following very unusual cases treated with plasmochin compositum.

Case 1.—Sepoy Sardara Ram, 2|4th Bombay Grenadiers, was admitted to the Indian Military Hospital, Pishin, on 8th February, 1928, with lobar pneumonia and concurrent malaria, a mixed *P. vivax* and *P. falciparum* infection. He was given pneumonia treatment and plasmochin 0.02 gm. with quinine sulphate 0.25 gm. t.i.d.

10th February, 1928.—Temperature, 102°F.; pulse, 104; respirations, 48 p.m. Leucocytes, 16,968 per c.mm. Injection of sodium nucleinate. Plasmochin and quinine as above.

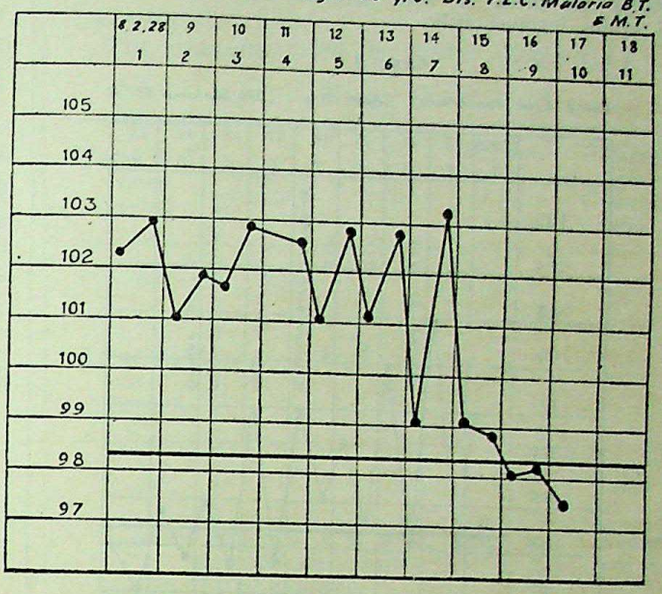
12th February, 1928.—Temperature, 101°F.; pulse, 116; respirations, 44 p.m. Leucocytes, 18,125 per c.mm. Treatment as above.

on 8th March, 1928, for broncho-pneumonia with concurrent malaria—a *P. vivax* infection. He was put on to pneumonia treatment with quinine sulphate, 30 grains a day; and injections of sodium nuclinate were also given.

12th March, 1928.—Temperature, 100°F.; pulse, 90; respirations, 30 p.m. Blood films show *P. vivax* present.

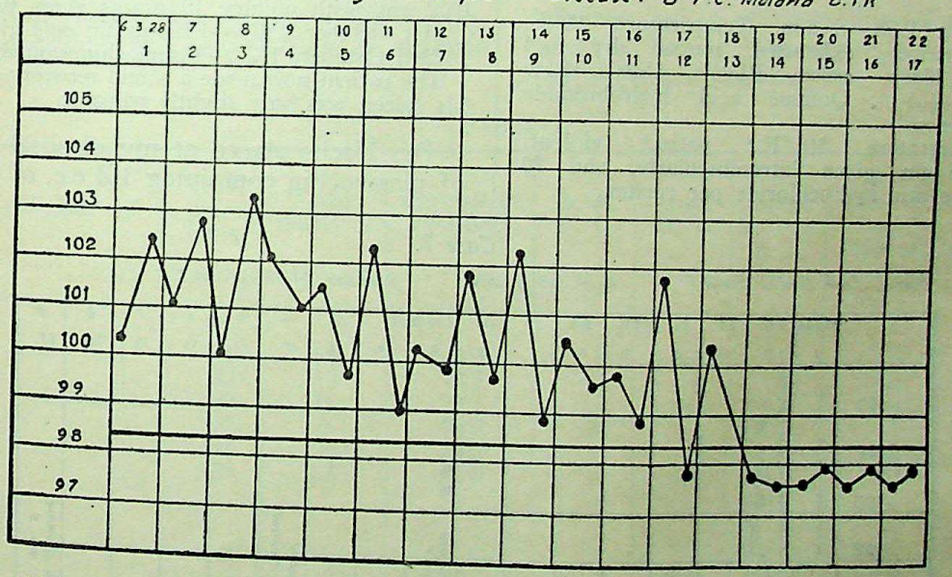
CASE 1.

Name. Sep Sardara Ram Age. 28. yrs. Dis. P.L.C. Malaria B.T. & M.T.



CASE 2

Name. Cook Lalchand. Age. 23 yrs Disease. B P.C. Malaria B.T.R



13th February, 1928.—Temperature, 100.8°F.; pulse, 118; respirations, 36 p.m. Leucocytes 21,875 per c.mm. Blood films show no *P. vivax*, but scanty *P. falciparum*.

14th February, 1928.—Temperature, 99.2°F.; pulse, 108; respirations, 48 p.m. Plasmochin stopped.

15th February, 1928.—Temperature, 99°F.; pulse, 100; respirations, 42 p.m. Leucocytes, 18,750 per c.mm.

16th February, 1928.—Temperature, normal; but *P. vivax* and *P. falciparum* both numerous in blood films. Given quinine sulphate gr. 10 b.d.

18th February, 1928.—Temperature, normal. Leucocytes, 6,800 per c.mm. *P. vivax* and *P. falciparum* both present.

20th February, 1928.—No parasites seen in films. Patient discharged.

Case 2.—Lalchand, cook, 2|4th Bombay Grenadiers, was admitted to the Indian Military Hospital, Pishin,

Leucocytes, 8,906 per c.mm. Plasmochin 0.02 gm. plus quinine 0.25 gm. t.i.d.

13th August, 1928.—Temperature, 99.6°F.; pulse, 96; respirations, 30 p.m. *P. vivax* present. Treatment as before.

14th March, 1928.—Temperature, normal. Plasmochin stopped. Quinine sulphate 30 grains a day.

18th March, 1928.—Temperature, 102°F., and a rigor developed. Blood films showed *P. falciparum*. Plasmochin 0.02 gm. with quinine 0.25 gm.

19th March, 1928.—Temperature, 102°F., with rigor. Blood films show *P. falciparum*.

20th March, 1928.—Temperature, normal. No parasites seen in films. Plasmochin stopped.

1st April, 1928.—Discharged well.

Case 3.—Cook, 2|4th Bombay Grenadiers, admitted to the Indian Military Hospital, Pishin, on 12th September, 1928, suffering from malaria—a *P. falciparum*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

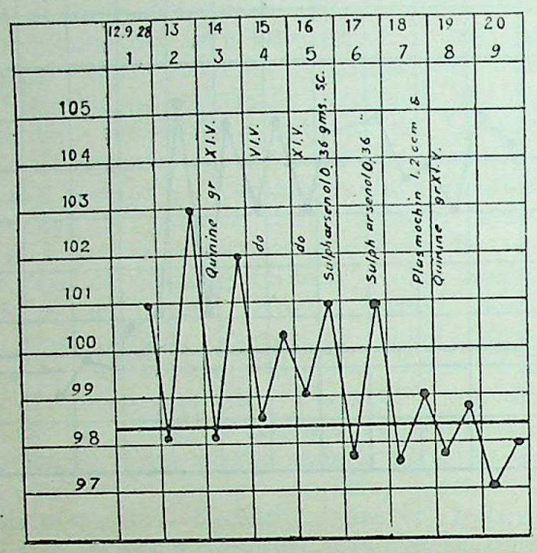
infection. He was given 30 grains of quinine sulphate daily, and the picric acid test for quinine in the urine was positive.

At midnight on the 14th and 15th September, 1928, the patient became delirious and cerebral malaria developed. During the previous 36 hours he had received 50 grains of quinine orally. He was given 10 grains of quinine acid hydrochloride intravenously and 20 grains orally.

15th September, 1928.—Patient delirious. Passed fæces and urine in bed. Quinine acid hydrobromide 5 grains intravenously.

CASE 3

Name Cook Nantaram Age 19 yrs Dis. Malaria M.T.R.



16th September, 1928.—8 a.m. Temperature, 99°F. Patient semi-conscious, exhausted, tongue dry and covered with black crusts. Blood films show *P. falciparum* +++. Quinine acid hydrobromide 10 grains intravenously.

8 p.m. Temperature, 101°F.; patient violent. Sulfarsenol, 0.36 gm. given intramuscularly, and 20 grains of quinine acid hydrochloride per rectum.

Thereafter 30 grains of quinine was given daily by the mouth.

18th September, 1928.—Temperature normal, but patient's mental state is vague. *P. falciparum* still present in films. Plasmochin 0.02 gm. with quinine 0.45 gm. given orally t.i.d.

Intravenous injection of 1.2 c.c. of a 1 per cent. solution of plasmochin with quinine 20 grains and pituitrin 1 c.c. in 20 c.c. of aqua distillata.

After this the temperature remained normal, and on the 20th no parasites could be detected in films. The plasmochin compound was continued t.i.d. until the 24th September, thereafter twice daily till the 30th, and once daily till October 4th. The patient was then discharged.

Cases 4, 5 and 6.—Three other cases of cerebral malaria in children, one aged 4 years, and the other two 5 years, were successfully treated by intramuscular injections of plasmochin (dose for an adult 1.2 c.c. of a 1 per cent. solution) with quinine acid hydrobromide (adult dose 5 grains in 1 c.c. of water) given deeply into the triceps.

Case 7.—Budhe Singh, cook, was admitted to hospital on the 23rd September, 1928, with a temperature of 102°F., a spleen enlarged to the umbilicus, and *P. falciparum* present in blood films. He was given 30 grains of quinine sulphate orally a day and an intravenous injection of 5 grains of quinine bihydrobromide.

24th September, 1928.—Temperature rose to 102.8°F. Plasmochin 0.02 gm. with quinine acid hydrochloride 5 grains t.i.d.

1st October, 1928.—Plasmochin-quinine reduced to twice daily.

4th October, 1928.—Plasmochin stopped. Quinine 30 grains orally a day.

5th October, 1928.—Evening rise of temperature.

9th October, 1928.—Plasmochin compound again administered, as above, t.i.d.

15th October, 1928.—Plasmochin compound twice daily. The temperature rose to 99°F. Plasmochin 0.02 gm. with quinine 10 grains given twice daily.

21st October, 1928.—Plasmochin only given once daily.

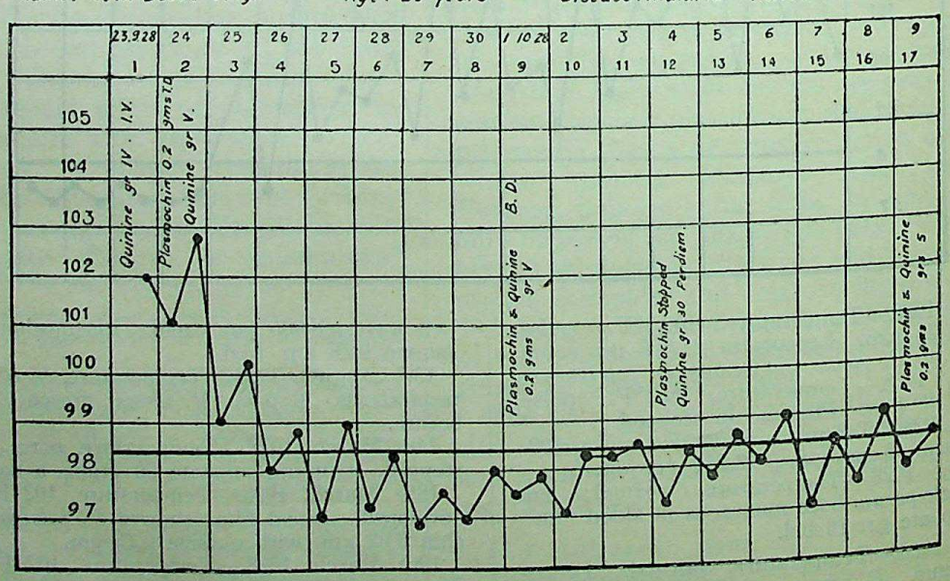
23rd October, 1928.—Plasmochin stopped.

The patient now made a sound recovery. On discharge his spleen was only slightly palpable.

Dr. Urchs placed at my disposal 70 ampoules of plasmochin containing 1.2 c.c. of a 1 per cent.

Case 7.

Name. Cook Budhe Singh Age. 23 years Disease. Malaria M.T.F.



17th September, 1928.—8 a.m. Temperature, normal. Tongue moist and clean, but *P. falciparum* still present in films.

8 p.m. Temperature, 101°F.; patient violent. Same treatment as on the night previously.

solution and I administered these intramuscularly and intravenously alone, as well as combined with quinine acid hydrobromide, without noticing any ill effects. I have suggested to him to put on

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the market a preparation of plasmochin which can be given subcutaneously combined with quinine acid hydrobromide. If such a preparation is made available it would be of great value in malaria therapy.

I cannot close without expressing my gratitude to Col. A. H. Safford, A.D.M.S., Baluchistan District, for encouragement and help, and thanks to my former assistant Sub-Assistant-Surgeon Prem Singh, L.M.D., for willing co-operation.

A RECORD OF MALARIAL CASES IN THE BENGAL-NAGPUR RAILWAY CONSTRUCTION HOSPITAL, TITLAGARH FROM JULY 1928 TO AUGUST 1929, WITH SOME OBSERVATIONS ON MOSQUITO FINDINGS AND CONDITIONS OF TRANSMISSION.

By W. D. SPEEDY, M.B., B.Ch. (Dub. Univ.),
Medical Officer, Raipur-Vizianagram Construction,

and

A. K. ADHIKARI, M.B.,
Assistant Surgeon, Malaria Investigation.

THE following figures taken from the laboratory records of the above hospital, have been collected in response to the appeal in the *Indian Medical Gazette* for August 1929, for information regarding the parasitology of malaria in India:—

TABLE I.

Month and year.	Total blood films.	Total positive.	Percentage positive.	Total B. T.	Total M. T.	Total mixed M, T & B. T.	M. P. positive but doubtful.	Negative.	Approximate population.
1928.									
July (21st to 31st)	11	10	90·9	9	Nil	1	Nil	1	270
August	43	19	44·2	13	4	2	Nil	24	270
September	42	16	38·1	14	Nil	2	Nil	26	270
October	37	26	70·0	24	1	Nil	1	11	250
November	48	36	75·0	34	1	1	Nil	12	250
December.	26	23	88·0	19	4	Nil	Nil	3	244
1929.									
January	9	4	44·4	4	Nil	Nil	Nil	5	242
February	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	244
March	1	1	100·0	1	Nil	Nil	Nil	Nil	250
April	5	2	40·0	1	Nil	Nil	1	3	275
May	1	1	100·0	1	Nil	Nil	Nil	Nil	275
June	3	3	100·0	3	Nil	Nil	Nil	Nil	213
July	11	8	72·7	7	Nil	Nil	1	3	213
August	20	7	55·0	9	2	Nil	Nil	9	213

Note:—Total blood films examined over the period was 257. Of these 160 were found with malarial parasites giving a 62.5 per cent. positive result.

The routine followed is, that all cases reporting with fever have a blood film taken. Those showing parasites are at once put on quinine or plasmoquine with quinine, and those negative to malarial parasites on an alkaline or diaphoretic mixture until two other slides taken on subsequent days give no positive result. There is thus very seldom any necessity for classifying cases as "clinical," for in practically all genuine cases parasites are found, especially in the thick drop preparation.

Films are made, both thick and thin, on the same slide. Diagnosis for treatment is made from the thick, and final differentiation of species from the thin film.

The staining used is either Leishman's or

TABLE II.

Total B. T. over period	Rings or schizonts.	Gametocytes.	Percentage rings or schizonts.	Percentage Gametocytes.
140	139	1	99·3	0·7
Total M. T. over period.				
12	11	1	91·7	8·3

Note:—6 mixed B. T. & M. T. (rings) and 3 malaria parasite rings positive but doubtful not included in above.

Giemsa's, and this is carried out by Hospital Assistant, Assistant Surgeon, Malarial or Medical Officer and in all cases final diagnosis rests with the two latter. Discussion is encouraged as even experts are known not to be infallible, and recourse in doubtful films is made to the Malariologist of the Railway.

A certain proportion of negative findings must be attributed to the unofficial taking of quinine or patent medicines containing it, and in such

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

cases the diagnosis must be of necessity "clinical," but these are rare. Reference to Table II shows a very small percentage of gametocytes; this may be due to the conscientious "following up" of cases by the Assistant Surgeon in the hospital and insistence on a complete quinine course.

It is noticed that out of 160 positive cases, some 82 are from a better paid class, while 78 are menials. This, however, is not advanced as a proof that better feeding conditions, etc., are without value, for the latter group are nearly all local inhabitants and their staple food, rice, is cheap and plentiful, while acclimatisation no doubt plays its part.

and the adults are able to survive, though not evident in any great numbers, that fresh cases occur. Thereafter although humidity is still favourable in January and February the incidence of fresh cases is very small and remains so until practically one month after the outbreak of the rains, i.e., until the middle of July, when fresh cases rapidly increase. (The rains usually break about June 10 to 15th.)

It is probable that this period of a month, with its favourable humidity, and breeding conditions, gives time for a number of carriers to develop, become infected and transmit. Another factor, however, deserves consideration, i.e., that at a distance of under a mile, a *nala*, diminishing in

TABLE III.

Month.		Rainfall in inches.	Average humidity 8 A.M.	Larval findings.	Locality.
July ..	1928	17·4	85·7	*A. culicifacies.*	Scanty in uncultivated paddy fields with fresh rain water.
August ..	,,	9·9	88·7	*A. culicifacies, rossi* (few), *vagus.*	Young cultivated paddy.
September ..	,,	15·1	95·2	*A. culicifacies, fuliginosus, philippinensis ?*	Pools in paddy fields.
October ..	,,	4·5	85·8	*A. fuliginosus.*	Pits in paddy field. Last water with vegetation.
November ..	,,	*Nil*	78·7	....	
December ..	,,	*Nil*	81·3	....	
January ..	1929	*Nil*	73·8	....	
February ..	,,	*Nil*	76·4	....	
March ..	,,	*Nil*	50·5	See text.	
April ..	,,	*Nil*	49·6		
May ..	,,	*Nil*	46·8	....	
June ..	,,	6·7	67·8	....	
July ..	,,	20·2	81·6	*A. culicifacies.*	Uncultivated paddy.
August ..	,,	20·8	79·8	*A. culicifacies, rossi* (few).	Young cultivated paddy.

Note:—From the middle of November to middle of June, the main breeding grounds, i.e., the paddy field area, are surface dry. Only the *nala* referred to remains wet and this in May and early June as stagnant pools.

TABLE IV.

Month.	Maximum 24 hours. temperature.	Minimum 24 hours. temperature.
October ..	32·7° C	23·3° C
November ..	29·0° C	13·3° C
December	26·6° C	11·1° C
January ..	29·0° C	11·6° C
February ..	32·7° C	12·7° C
March ..	39·4° C	17·2° C

The breeding grounds which would appear to affect the settlement from which the bulk of the patients come, are collections of fresh rain water in the uncultivated fields, and later these same fields in their flooded condition during early paddy cultivation.

September appears to mark the close of the greater part of *A. culicifacies* breeding in the above localities, and it is noticed that for some three months after this, during which period the humidity remains favourable for transmission,

size as the hot weather advances, and found in March and April as a mere trickle, to be swarming with *A. culicifacies* larvæ and pupæ, may provide an anopheline population, harmless in the dry heat of April, May and part of June, but potentially dangerous shortly after the outbreak of the rains.

Two possible explanations for the practical cessation of cases after December are suggested, (1) that the allotted span of a mosquito's life would appear to be roughly three months, and (2) that the temperature which varies, as seen in Table IV actually either prevents, or is inimical to, the development of sporozoites during the period from the end of November up to the end of February, at which time the humidity is favourable, and from March onwards the picture is reversed, i.e., temperature favourable but humidity not so.

The above observations may be of interest to those who, in common with the inhabitants of this district and so many others in India, experience this annual outbreak over a limited period, and it is specially so to the writers, contrasting so sharply as it does with another

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

district within fifty miles where climatic conditions and breeding places are entirely different and where the disease is endemic throughout the year.

Our thanks are due to Dr. A. M. Leake, V.C., F.R.C.S., the Chief Medical Officer, for permission to publish these notes, to R. Senior-White, Esqr., F.R.S.E., the Malariologist, for reading them over, and to Dr. J. B. Sen, Assistant Surgeon at the above hospital, who has recorded the readings for the humidity table over the period, and has co-operated in every way.

A Mirror of Hospital Practice.

A CASE OF FILARIAL ABSCESS.

By H. W. ACTON,

LIEUTENANT-COLONEL, I.M.S.,

Director and Professor of Bacteriology and Pathology,

and

S. SUNDAR RAO, L.M.P.,

Darbhanga Scholar,

Calcutta School of Tropical Medicine and Hygiene.

A CASE of filarial abscess has recently been studied at the Carmichael Hospital for Tropical Diseases, Calcutta, which confirms some of the views expressed by Acton and Rao (1929) on the rôle of secondary organisms in the causation of filarial diseases. This is an interesting case in which from a filarial abscess in the right femoral region a hæmolytic streptococcus was cultured; an organism of the same strain was subsequently isolated from the urine of the patient, and was finally traced to a focus of infection in the teeth.

S. C. M., aged 24, was admitted into the hospital with high fever and an abscess in the right femoral region. The temperature ranged between 102°F. and 104°F. for a week prior to admission. This patient was previously examined in connection with a severe form of urticaria which he was suffering from; during the routine tests, he was found to be sensitive to micro-filariæ.

The abscess was opened and cultures were taken on blood-agar; the cultures showed a pure growth of a long-chain hæmolytic streptococcus. From inside the abscess, two long bits of live adult filariæ measuring 22 and 10 mm. long and 103 μ to 145 μ thick (head end 60 μ to 68 μ thick) were recognized and separated out from the blood clot. Only the head end was obtained, the tail end being missed. These worms were full of eggs and nearly mature embryos. These observations show that the abscess was a typical filarial one.

Attempts were now made to locate the source of secondary infection of the abscess and an examination was made of the nose, nasopharynx and tonsils; these examinations gave negative results. The left antrum gave defective illumination when tested and it was suspected that it might be a source of the infection; this was explored with a negative result. Blood was cultured on glucose broth in two different days and no growth was obtained. Stools were examined for ova, protozoa and cultured for non-lactose fermenters; the results were entirely negative.

A catheter specimen of the urine was then cultured and it revealed a pure growth of a faintly hæmolytic strain of streptococcus. This organism gave the same sugar reactions as the one isolated from the abscess; i.e.,

Sugar reactions:

Glucose = A; Mannite = O;
Saccharose = A; Salicin = O;
Litmus milk = C.

A skiagram was taken of the teeth and it was found that a few teeth showed marginal infection. Cultures were taken from these teeth and a streptococcus was isolated which gave the identical reactions found in the case of the organisms isolated from the filarial abscess and from the urine.

The stools were plated for streptococci every day, for over five days and the results were negative. There was no skin lesion of any importance.

As a routine procedure, the blood was examined for parasites, with negative results, except for microfilariæ seen in blood smears taken at night. The following was the total and differential leucocyte count:—

Leucocytes	..	17,000 per c.mm.
Polymorphs	..	76 per cent.
Lymphocytes	..	18 per cent.
Mononuclears	..	1 per cent.
Eosinophiles	..	5 per cent.

The investigations in this case show how from a focus of streptococcal infection in the teeth, the filarial abscess had derived its secondary infection, the presence of the organism in the urine, without any pathological symptoms in the genito-urinary system, showing that this occurred *via* the blood stream.

In another paper, the authors (Acton and Rao, 1929*a*) have discussed the process by which the defensive mechanism of the tissue is weakened as a result of the invasion by the filaria. When this has taken place, it is easy for the secondary organism from some focus of infection to get into the weakened tissue through the blood stream and to produce either local inflammation ending in an abscess, as in the present case, or lymphangitis. This depends on the tissues affected by the parasite; if it is purely local, as in the present instance, a local inflammation is produced. If it is a more generalized irritation affecting the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

lymphatic trunks, lymphangitis is produced. If it affects the smaller lymphatics, the clinical condition known as cellulitis is the result.

REFERENCES.

Acton, H. W., and Rao, S. Sundar (1929). The Importance of Secondary Infection in the Causation of Filarial Lymphangitis. *Ind. Med. Gaz.*, Vol. LXIV, August 1929, p. 421.

Acton, H. W., and Rao, S. Sundar (1929*a*). Kataphylaxia: a phenomenon seen clinically in acute filariasis. *Ibid.*, Vol. LXIV, Nov. 1929.

A CHRONIC ENCYSTED MAMMARY ABSCESS SIMULATING SCIRRHOUS CANCER.

By COLONEL B. H. NANAVATTY, C.I.E., F.R.C.S., F.C.P.S., etc.,

Medical Corps, Indian Territorial Force, Ahmedabad.

THE notes of the following case will probably prove interesting alike to the student and the practitioner, and teach him how very necessary it is to be cautious in arriving at the correct diagnosis after the fullest possible consideration. He will also find from the notes given below, how puzzling it is at times to recognize one disease from another.

About a few years ago I was consulted by a lady for a slowly growing tumour of the left breast. The brief notes then recorded were as follows:—Age about 55; is the mother of two children and has passed the climacteric; well built and healthy looking. There is no history of injury to the part or of family predisposition to any particular disease. Examination of the heart and other organs as well as of urine reveals nothing abnormal.

The breast is enlarged and swollen. An indurated lump (of the size of a small orange) is detected within and it does not appear to be incorporated with the breast substance. The skin over almost the whole of the breast has a brownish dusky hue. It is free and uninvolved, whilst the breast itself is movable over the deeper parts and is not adherent to the pectoral fascia. There is no pain on pressure and beyond the fact of the breast being enlarged, heavy and swollen, the patient has no other complaint to make. The nipple is not drawn in or retracted, but the axillary glands are enlarged and swollen, but not painful on touch or pressure. No fluctuation can be detected. The right breast has a normal appearance and is not affected in any way.

Later appearance of the breast (after six to eight weeks).—When seen again after a lapse of six weeks or so the tumour has distinctly increased in size, but in other respects the signs and symptoms remain almost the same as before. The patient now sometimes complains of a severe neuralgic pain in the breast, though in other respects it still continues as an almost painless tumour; the discoloration of the skin has become more marked. An important sign has now developed; the nipple is found to be retracted. As time advanced the nipple was still more retracted, the axillary glands more enlarged and the breast itself became slightly painful on pressure. Though carefully looked for no fluctuation could be detected and the tumour to all outward appearances presented many of the classical signs and symptoms of a scirrhous cancer of the breast. It may be added there was no fever at this stage or before.

An exploratory puncture was now proposed, but the patient being a nervous lady it was not allowed. A friendly consultation was now held with an experienced surgeon of Bombay who happened to be with me for a day and he too felt doubtful as to the nature of the case without making an exploratory puncture. He, however, felt inclined to the belief that it was a scirrhous growth, inasmuch as the lady had lost weight, had grown weaker to some extent and the axillary glands had still further enlarged.

Appearance of the tumour later on (10 to 12 weeks after).—A month later the breast presented much the same appearance as before, but was distinctly more enlarged. For the first time a slight pain was complained of and this was increased by pressure. On palpation an indistinct sense of fluctuation was now felt. With the development for the first time of this additional symptom it became clear that the tumour in all probability was an encysted chronic mammary abscess, and not a scirrhous, as was at first suspected. The tumour, however, still continued to be circumscribed, firm and hard and the nipple was almost completely retracted. The patient was certainly thinner than before but cannot by any means be said to be of a cachectic appearance.

Briefly speaking the tumour presented many of the ordinary symptoms of a scirrhous growth, and though a few certain signs were wanting to complete as it were the picture of the latter disease, most of the symptoms vaguely pointed in that direction. As, however, fluctuation, even though slight, was now felt on deep palpation, it seemed probable that the case was one of a chronic deep seated abscess. The lady was therefore pressed again to allow an exploratory puncture to be made. This after a good deal of persuasion was allowed under chloroform, and on this being done the nature of the case became at once evident and a stream of thin viscid pus, unmixed with blood, came out. It was now clear that it was a case of chronic encysted mammary abscess of the breast and the rest of the procedure was simple enough. The abscess was freely opened under aseptic precautions, and the loculi within broken down and free drainage allowed. The wound gradually healed up in about three to four weeks time.

After results.—The subsequent recovery and convalescence were uneventful. The patient rapidly regained her health and is alive at present. It may here be added that the patient now recollects having had a fall from the top of a staircase about 8 months previously. But this she had entirely lost sight of when first questioned on the subject. She does not remember however that her breast was in any way injured even then.

Differential diagnosis.—The condition might have been mistaken for any of the following:—(1) Chronic lobar mastitis, (2) Chronic lobular mastitis, (3) Cystic growths, (4) Adenoid tumours (e.g., adenoma, adeno-fibroma, adeno-sarcoma and the cysto-adenoma), (5) Cancers of the breast.

Remarks.—The case was interesting and in a way rather puzzling for the following reasons:—

1. The outward appearance of the tumour, the rather hard—but not stony hard—firm and circumscribed growth, the retraction of the nipple, the enlargement of the axillary glands, the age of the patient, the absence of fever, also of pain until a later date, were all more or less suggestive of scirrhous tumour of the breast.

2. The absence of history of trauma, of fever at any time previous to the onset of the disease, and the fluctuation (absent till a later period), diverted the attention for a time, from the case being considered as one of abscess.

3. The refusal of the patient to allow an exploratory puncture to be made when first suggested, delayed diagnosis at an earlier date.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail)

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones. The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460 BOMBAY.

Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

Superior Gland Products.

Two Opocrins offer outstanding advantages as treatments of climacteric and other troubles.

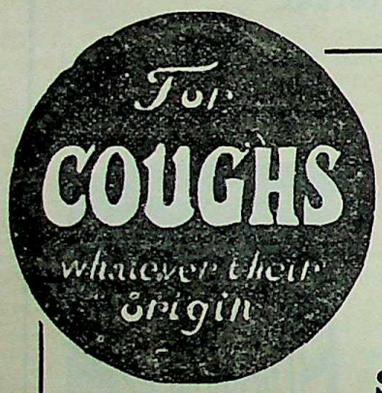
Opocrin Ovaro-Adrenal Compound.

Ext. Ovary 7 ctgr.
Ext. Thyroid 2 ctgr.
Ext. Pituitary 3 ctgr.
Ext. Suprarenal 3 ctgr.
in each Opocrin

Opocrin Orchitic-Adrenal Compound.

Ext. Orchitic 7 ctgr.
Ext. Thyroid 2 ctgr.
Ext. Pituitary 3 ctgr.
Ext. Suprarenal 3 ctgr.
in each Opocrin

Dose Four to Eight "Opocrins" daily.

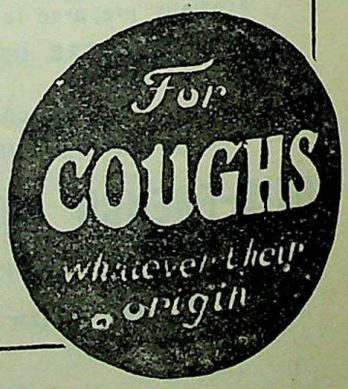


ONE GRAMME CREOSAL CONTAINS		
Gualacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

50 Centigrammes **CREOSAL** per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.



CREOSAL A.F.D. has none of the inconveniences of Gualacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY
P. O. Box 226, MADRAS

Telegrams: "AMPSALVAS."

P. O. Box 7861, CALCUTTA.
P. O. Box 134, RANGOON.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

NOVEMBER.

RESEARCH IN FILARIASIS.

FILARIASIS is a subject which has from time to time attracted the research worker, but in view of its importance—its very extensive distribution and the severity and permanency of the lesions that so frequently occur in this infestation—it has not received the attention which it deserves, especially in recent years.

It is difficult to see the reasons for this. Possibly it is felt that the transmission problem is solved and that the treatment problem is hopeless; a little consideration will, however, show that in neither instance is it the case. (The word filariasis can be applied to infestation by any of the filariæ; but here it is used in its more restricted sense to mean infestation by *Filaria bancrofti*.) Manson, as long as 1878, first incriminated the mosquito as intermediary host, but he was under the impression that transmission occurred through the agency of water which had become contaminated by the mosquito. Later, Low showed that the filaria entered the proboscis of the mosquito, and subsequently the true transmission cycle was worked out; this is, shortly, as follows:—the mosquito feeds on a person with microfilariæ in his blood; after a short time in the mosquito's stomach the ingested microfilariæ wriggle out from their sheaths and penetrate into the thoracic muscle of the mosquito; here they undergo development: they progress forward towards the head, eventually coming to rest in the labium of the proboscis; when the mosquito next takes a feed on a suitable host the immature adult filaria escapes on to the skin by working its way through the inner lining of the labella (Dutton's membrane), usually at the tip; and finally it penetrates the skin of the new host. When it has gained access to its new host the filaria passes from the lymphatics of the skin to the larger lymphatic channels, through the various sets of glands, and if not in any way checked in its progress, it eventually reaches the main lymphatic trunks or even the receptaculum chyli. Here the female lays large numbers of embryos which again pass into the blood stream and complete the cycle. The different clinical manifestations of the infestation are dependent on the fate of the worms during their progress from the point of entrance towards their goal; at any point their further progress may be barred. Roughly speaking two pathological changes may occur; there may be complete blocking of the lymphatics of a part of the body; this will eventually lead to the development of elephantiasis, a condition which is most commonly seen in the limbs. Or there may be partial blocking; this will eventually lead to distension and varicosity of the lymphatic vessels, usually of the abdomen and pelvis. Practically all the clinical manifestations of filariasis can be explained on the basis of the occurrence of one or other of these two changes, combined with secondary bacterial invasion.

It has been observed in some endemic areas that embryos are present only in about 5 per cent. of persons suffering from elephantiasis, and that less than half those persons with numerous embryos in their blood show any clinical manifestations of the disease. This has led to doubt arising regarding the association of this infestation with some of the clinical conditions, more especially elephantiasis, which have been attributed to it. These conditions are now, however, universally accepted as being at least sequelæ of filarial infestation. The points of evidence in favour of this can be summarised shortly as follows:—

The close correspondence of the distribution of *Filaria bancrofti* and elephantiasis.

The frequent association in the same locality and even in the same individual of certain clinical types of lymph varix and glandular enlargement, conditions which have been proved to be due to filarial infestation, with elephantiasis.

It has been shown that the filariæ block the lymphatics; extensive blocking of the lymphatics, from whatever cause, will eventually lead to the development of elephantiasis.

The absence of microfilariæ from the blood of individuals with elephantoid conditions is explained on the ground that a large and important skin area is cut off from the central lymphatic system and therefore from the blood stream; filariæ that gain entrance through the skin in the area distal to the block cannot penetrate beyond a certain point, and either they fail to reach maturity, or, if they do, their larvæ cannot reach the blood stream. It also seems possible that, on account of the very large number of filariæ which are caught up in the narrowed lymphatic channels in an elephantoid limb and destroyed, some lytic substances may be formed which adversely affect filariæ in other parts of the body.

Numerous investigations have been made in various countries to ascertain the local carrier. In India *Culex fatigans* is the principal carrier, though other mosquitoes have been found to harbour filariæ in Nature, and in the laboratory to be potential carriers. Many other problems connected with the disease have from time to time been tackled; one of the most fascinating subjects of research, but more frequently of pure speculation, has been the problem of filarial periodicity. In most endemic areas the microfilariæ only appear in the blood at night; during the day time no embryos are present, as darkness approaches a few appear, their number increases, reaching its maximum during the night and then

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

decreases towards morning. There are a few other areas, e.g. Fiji, where there is no periodicity, the embryos being present both during the day and the night. This periodicity is not a chance one as it corresponds in time with the feeding habits of the main carrier mosquitoes of the locality, but no satisfactory explanation of the mechanics of this periodicity has been yet put forward. Attempts have been made to explain it on the grounds of posture, of capillary constriction during the day, and, recently, of cyclical parturition on the part of the adult worm. Most of the theories are dependent on isolated observations and none of them appear to fit in with half the known facts. Thus it remains one of the minor, and practically not very important, mysteries of tropical medicine.

The treatment of the disease has been consistently disappointing. It can be said quite fairly that no substance has been yet found which has any effect on the longevity of the adult worm. Here we are up against a very serious difficulty; the worms live in the lymph stream and we know no drug which will penetrate to the lymph in anything but the minutest traces. Drugs can be injected directly into the blood stream and it is quite conceivable that one could be found which would destroy the microfilariæ, but this would be waste of time as microfilariæ cannot possibly do any harm to the individual in whose blood they are circulating. However, chemotherapy has made such great advances during the last few years that there is considerable hope that a drug with the necessary properties will eventually be found.

In the production of the various clinical manifestations of filariasis the part played by secondary infecting organisms has been recognised and attempts have been made to attack these by means of vaccines; so far this is the only line of attack which has shown any promise, and it is one that should be followed up. For the grosser lesions the aid of surgery has had to be called in; this is a frank admission of weakness.

Some important papers on the subject of filariasis have appeared in this journal during the current year. These papers report the work on this subject which has been carried out at the Calcutta School of Tropical Medicine and Hygiene during the preceding 5 or 6 years. In the March issue Chopra and Sundara Rao reported the results of therapeutic experiments in the treatment of the disease. The results, as far as destruction of filaria was concerned, were unfortunately entirely negative, but with one drug, tryparsamide, slight clinical improvement was noted in some cases, and chyluria, where this was present, usually disappeared, temporarily at any rate. However, as the treatments were carried out carefully, often in hospital, and the progress of the patients observed, both clinically and by examination of the blood, the negative evidence thus obtained is of considerable value and further investigation with most of these drugs has been rendered unnecessary. These writers were also able to show that in the daily filarial counts there were considerable normal variations, which probably accounted for the apparent success with certain drugs that have been reported from time to time. In another paper, Acton and Sundara Rao reported the results of investigation and treatment of another series of cases of filariasis; in these cases they concentrated their attack on the secondary bacterial infections, and they achieved considerable success. They point out that wherever there is a secondary bacterial infection, there must be some focus from which this arises; the focus may be a temporary, external focus, such as tinea with secondary streptococcal infection, or a more permanent, internal focus, such as an apical abscess, enlarged and septic tonsils, or intestinal ulceration. In some instances they have been able to recover the same organism from the filarial abscess, from the septic focus and from the urine, thus showing that the blood stream is the connecting link between the focus and the lymphangitis or abscess. Treatment consists in eradication of the focus, by suitable treatment and giving autogenous vaccines for the local condition. The treatment of this condition by means of vaccine is not entirely new, but these writers have emphasised the importance of finding and eradicating the septic focus and have given us a clearer conception of the processes by which secondary infection of the local filarial lesion occurs. The publication of a second paper by the same two writers constitutes a very distinct advance in our knowledge of the pathology of the disease; this paper appears elsewhere in the present number of the *Gazette*. The following is their conception of the pathology of the disease:—

In the production of the lesions of elephantiasis there are two quite distinct factors at work, the filarial toxin and the bacterial toxin; the former may be liberated by the female worm during parturition, or at its death, following trauma or strangulation. The evidence which is adduced for the existence of the filarial toxin is, (*a*) analogy with *Filaria medinensis*, (*b*) the presence of a higher eosinophilia in those cases in which there is no obstruction, and in which the filariæ become fully mature and numerous microfilariæ appear in the blood stream, and (*c*) the periodic attacks of urticaria, headache and other signs of intoxication, unaccompanied by local suppuration, from which filarial patients suffer. Distinction can be made clinically between the local conditions produced by the filarial toxin and those caused by streptococcal invasion, but not always between the former and the milder staphylococcal lesions. pathologically, however, there is a marked difference between the tissue reactions to the filarial and to the bacterial toxin; in the former there is formation of eosinophilic granulation tissue, as against abscess formation or diffuse cellulitis in the latter.

The sequence of events in the production of the various lesions is as follows:—Wherever the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

female comes to rest irritation is produced in the walls of the lymph vessel; this is always more marked at the head end—which is also the vulval end—of the worm; the inflammation thus produced causes obstruction; and periodic obstruction leads to varicose formation. The constant irritation also causes endothelial proliferation, the formation of papillomatous growths—which are easily damaged and may bleed, causing the formation of hæmatomata—and finally complete occlusion of the vessel. This blocking diverts the lymph flow through the collateral vessels, which become dilated, and the formation of the typical lymph varix with its sequelæ, chyluria, chylocele, etc., follows. The passage of the adult worms is also impeded; these are diverted into the varices where they mature, parturate, and die, aggravating the local condition. This is the usual sequence of events in the pelvic and abdominal lymphatics where the collateral circulation is good, but in the limbs where this is not so well developed alternate courses for the lymph flow are rapidly exhausted and complete obstruction eventually occurs.

In their passage from the point of entrance, usually in the extremities, the immature worms meet with little resistance at first, so that the majority get through into the abdominal and pelvic vessels. In their passage through the lymphatic glands they inevitably cause some damage to these structures. Scars which mark the track of a worm can often be seen in sections of a gland. Repeated scarring will lead to the replacement of most of the gland substance by fibrous tissue, until eventually the through-passage of the worm is obstructed. Worms are caught in the glands and eventually die; there is a local eosinophila and giant-cell reaction to this foreign protein, a cytolysin is probably produced by means of which, aided by giant-cell phagocytosis, the worm is absorbed. This process, however, entails the formation of much granulation tissue which become vascularised, so that eventually the whole gland is replaced by fibrous tissue and the lymph flow is completely obstructed. If the obstruction is in the inguinal glands, the lymph flow from the leg is deflected into the scrotum causing the lymph pressure to rise so that the skin lymphatics, being ill supported in this region, dilate and form small cysts which eventually burst, lymphorrhœa and the condition of "lymph scrotum" being established. When the obstruction is in the femoral glands the lymph flow from the limb is completely cut off; there is dilatation of the surface lymphatic spaces, hypertrophy of the papillæ, fibrotic infiltration of the deeper structures, destruction of the sweat glands, and eventually production of the typical thick, harsh and dry elephantoid skin. When such a condition has come about the filariæ which enter the skin in this limb cannot possibly get into the larger lymphatics so that very few of them become mature, and, even if they do become mature, their larvæ are unable to pass the obstruction and reach the blood stream.

The filarial toxin and the damage done to the lymph vessels and glands by both living and dead adult filariæ produces a condition of local kataphylaxis. Streptococci and staphylococci, carried by the blood stream from some septic focus in the body, settle in these damaged tissues; a new septic focus is formed and the usual sequelæ follow. The tissue reaction to the bacterial invasion undoubtedly speeds up the process of lymphatic obstruction, though theoretically it is quite conceivable that the whole process might occur without this secondary bacterial invasion, but it would take a longer time. The nature of the clinical manifestations will be dependent on the site of the new focus and on the species of the organism involved; they are very protean in character and vary from the so-called filarial colic, which is caused by a streptococcal invasion of the retroperitoneal lymph varices and which often ends fatally, to a subacute inflammation of a lymphatic gland around a dead worm, a condition which is caused by a staphylococcus and one which quite often subsides without coming to abscess formation. Kataphylaxis of the epiblastic tissue also occurs; the elephantoid skin in which keratinisation has been interfered with is liable to direct secondary invasion of bacteria from outside the body.

The writers of this paper have been able to demonstrate practically every stage in this process in pathological specimens which they have collected during the last few years, both from living patients and at the post-mortem table; a number of photomicrographs from their collection have been reproduced to illustrate their paper.

Another extremely interesting feature in this paper is the very ingenious explanation which the writers give for the differences in the clinical manifestations which predominate in the various endemic areas in India. In those parts of the United Provinces where filariasis exists chyluria is the predominant clinical manifestation, hydrocele and lymph varix of the cord occur, but elephantiasis is very rare; in Bengal and Orissa all types of the disease are observed; whereas in Southern India elephantiasis is the predominant manifestation, chyluria being rare. The explanation is that in the first-named area there are about two months in the year* when the climatic conditions are suitable for the transmission of the filariæ and the microfilaria rate in the general population is low, less than 10 per cent.; thus, only a small number of filariæ gain access to the patient and these only during a short period of the year; they pass unimpeded from the extremities to the abdominal lymphatics, damaging the lymphatic glands on their way, but the damage they do is very slight and quite insufficient to cause obstruction. Each year

* Sundara Rao and Iyengar have shown that a high degree of humidity combined with a moderately high temperature is essential for transmission; a paper on the subject by these two workers is in the press.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

more worms find their way into the abdominal lymphatics where eventually, after 20 years or so, they produce lymph varix. On the other hand in Southern India the climate is suitable for transmission for about nine months of the year and the microfilaria rate in the general population is often 20 per cent. or higher; here a continual stream of filariæ pass through the glands—the superficial inguinal or axillary—for most of the year; these glands very soon become damaged, and the train of events, detailed above, is started. Consequently complete obstruction frequently occurs in very young patients; these patients suffer from elephantiasis, but the filariæ are unable to pass the obstruction so that few gain access to the pelvic and abdominal lymphatics and microfilariæ are not found in the peripheral blood. In the intervening endemic area, Bengal and Orissa, both the microfilaria rate, and the age incidence and nature of the clinical manifestations are intermediate between these two extremes. In each of these areas there will be a percentage of the population who are not susceptible to the filarial toxin; in these persons the filariæ live and produce larvæ, but, as there is no tissue reaction to their presence, although microfilariæ are found in the peripheral blood, there are no clinical manifestations of the infestation.

Some observers have suggested that different varieties of *Filaria bancrofti* are responsible for the different clinical manifestations, but the explanation put forward by Acton and Sundara Rao appears to be far more feasible.

These recent researches suggest that filariasis is not an entirely sterile subject for investigation, and one hopes that in the near future more workers will be found to tackle other aspects of this very important problem.

There are many gaps in our knowledge of the transmission problem which require filling; much work requires to be done on the question of the season during which infections occur in the different endemic localities, and the potentialities of other species of mosquitoes as carriers require further investigation. With regard to treatment, only the fringe of the problem has been touched, up to the present. Many patients have been successfully treated, in that the progress of the pathological changes which occur has been arrested and the acute condition cured; even this treatment is not available for the mass of the population as it is laborious, and demands the individual attention of skilled workers. There are three ways in which the problem could be tackled:—(*a*) Transmission of the disease could be prevented, either by destruction of all the mosquito carriers or by protecting the population from the bites of these mosquitoes; this would be a very difficult problem in India; (*b*) By treating the whole population by some drug which would destroy the adult worm; a drug that will do this has still to be found, or (*c*). Finally, by desensitizing the individual, so that the worm could live harmlessly in his large lymphatic vessels; this last measure, even if it could be achieved, would be highly unsatisfactory, as it would mean that the danger of infection to the rest of the population was not only not decreased, but actually increased. The chemotherapeutic method would appear to offer the greatest possibilities as a public health measure, but, as we have already said, the problem is a difficult one. If some highly parasitotropic drug could be discovered which, when injected locally into the extremities, would be absorbed by the lymphatics and not by the blood stream, it would not only kill the worm in its progress up the lymphatics, but would destroy those that had already reached the pelvic and abdominal lymphatics. The intravenous route which up to now has been mainly employed offers little hope of success, even the oral route of administration should prove superior to this, as a drug absorbed from the intestinal tract passes almost immediately into the main abdominal lymphatics where it would encounter any worms which had penetrated as far as this.

L. E. N.

Medical News.

THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

As our readers are aware, the new London School of Hygiene and Tropical Medicine was formally opened by H. R. H. the Prince of Wales in July of this year. This immensely important project owes its existence firstly to the generosity of the Rockefeller Foundation; secondly, to the determination of the British Government to organise and subsidise the creation in London of a central organisation for the study of tropical diseases throughout the British Empire. The new school has now been opened, and the possibilities which lie ahead of it are immeasurable. We have received a full account of the organization and constitution of the school from its Secretary, and it is of such importance that we publish it below *in extenso*.

The great building which H. R. H. the Prince of Wales opened on July 18th in the presence of a distinguished company is the outcome of the recommendations made in 1921 by the Committee, under the presidency of Lord Athlone, appointed by the Minister of Health of that day, Sir Alfred Mond, now Lord Melchett. This Committee, finding that the post-graduate teaching of public health in London was inadequate and uneconomic, advocated the establishment of a central institution, affiliated to the University of London, wherein full provision should be made for instruction in all branches of preventive medicine.

The chief difficulty in the way of carrying this recommendation into effect was financial. The country, hard hit by the war, was staggering beneath a burden of debt and its trade and industries had not recovered from the conditions which had convulsed Europe, and indeed the whole world. Happily the Trustees of the Rockefeller Foundation in New York came to the rescue and Great Britain gratefully acknowledges the timely assistance which that wonderful and wealthy Foundation generously extended to it in time of need. Impressed by the results of their inquiries in many lands, the Trustees had reached the conclusion that, if the gospel of hygiene, a gospel of hope and comfort, a gospel of vital importance to mankind, was to be adequately served, a great teaching centre of the type envisaged by the Athlone Committee was a necessity. Furthermore, they recognised the peculiar advantages which London presented

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

as a site for such a school, in consequence of its traditions in public health work and organization, its medical associations, its prestige as a world capital, its position as a huge sea-port, its general relations to commerce and industry, the facilities it presents for studying well-nigh every type of hygienic problem, and accordingly the offered the Ministry of Health a sum of £460,000 towards the attainment of the project. This large sum was to be expended on the purchase of a site and on the building and equipment of an institution of the type required. The only accompanying condition was that the British Government should contribute adequately towards its maintenance.

In taking this action the Rockefeller Trustees paid a tribute to the proud position held by Great Britain as the cradle of modern hygiene, in other words, as the country which had led the way in placing public health administration and legislation upon a sound basis, and they expressed the hope that the School, while serving national and imperial needs, would have a yet greater scope, and would become a centre of world-wide influence, both in the way of training public health students and research workers and of furthering research into public health problems. To quote Sir George Newman, Chief Medical Officer to the Ministry of Health and a member of the Board of Management of the new School:

"The situation is something more than imperial, it is international: it is to create here in London a complete school of preventive effort, capitalized by American benefaction, maintained by student fees and Parliamentary grant and open to all nations."

Hence, the primary function of the School was to train medical men and women desirous of entering public health services in Great Britain and abroad, to undertake research work in all branches of preventive medicine, to instruct research workers, and to foster and encourage research in those sciences which must be studied and mastered if the progress of public health is to be assured. Very soon, however, the rôle of this School of Hygiene was notably enlarged.

As is well known, Mr. Joseph Chamberlain, when Colonial Secretary, founded in 1899, at the instance of Sir Patrick Manson, the father of modern tropical medicine, a school for the study of diseases of the tropics. This, the London School of Tropical Medicine, which for many years occupied premises at the Albert Docks and after the war removed to Endsleigh Gardens, was, from its commencement, under the ægis of the Seamen's Hospital Society, and had carried out most excellent and useful work and been of great service to our Colonial possessions. Negotiations with the Society led to the union of the new School of Hygiene with the London School of Tropical Medicine and there was thus formed the London School of Hygiene and Tropical Medicine, which was incorporated by Royal Charter on August 1st, 1924.

The union was timely, for it is now recognized that there is no sharp dividing line between the diseases of hot climates and those with which we are familiar in temperate latitudes. There are scarcely half a dozen diseases strictly limited to the tropics and sub-tropics and of these only one or two are of importance. Again, the principles governing hygiene in the tropics are identical with those followed in temperate regions. At the same time, the diseases nowadays chiefly encountered in the tropics require special attention, both clinically and with respect to those sciences which have an intimate bearing on their causation and spread. Apart from the bacteria, that group of vegetable micro-organisms to which the bacilli of plague and cholera belong, lowly forms of animal life—the protozoa—must be studied, for certain of them are responsible for diseases like malaria, sleeping sickness and one of the more important forms of dysentery. Some of the great tropical diseases are due to parasitic worms or helminths such as the hookworm and the flukes which pass part of their life-cycles in water-snails and with these the student must become familiar. Insects, like the mosquito, the tsetse-fly and the flea, are concerned in the transmission of serious tropical maladies and so entomology, or the study of insects, acquires a greater medical importance than it does in Great Britain where, however, insect transmission of disease is by no means a negligible quantity, as witness the iniquities of the house-fly and the rôle of the louse in typhus fever, a disease happily now rare. The hygiene of the tropics also requires special study, for though it is governed by the principles which are followed in safeguarding and improving the public health in Great Britain, the application of these principles often differs markedly in the tropics from the practice of hygiene followed in Europe and elsewhere.

The School, therefore, is charged with the duty of continuing and enlarging the instruction given in the old London School of Tropical Medicine and of providing facilities for research on the lines which have made that School famous the world over. The Rockefeller grant was generous and the idea of the School and its work, as formulated by the Board of Management, has been conceived in no niggardly spirit.

The type of building required for such a diversity of interests was the subject of long and careful consideration and, when preliminary plans had been prepared and details worked out, a limited number of architects with experience in laboratory construction was invited to submit designs. The successful design was submitted by Mr. P. Morley Horder, and Mr. Verner O. Rees, A.R.I.B.A., in association with Mr. Horder, has carried through the execution of the design so submitted. He has devoted himself whole-heartedly to the work and the result has justified his skill and care.

Particular attention has been directed to the library and museum. The former will eventually be a large and representative Library of Hygiene, using this word in its widest sense, and how wide that is, only those who have made the study of preventive medicine their life work can fully appreciate. The Museum, of a comprehensive and graphic type, consists of three parts, namely, sanitary engineering, hygiene in the general sense and tropical medicine. It marks a new departure in Great Britain, for the assistance of numerous large commercial interests was sought and most generously granted. A number of leading firms, whose business is concerned with public health activities of various kinds, have co-operated to present to the Museum exhibits of great educational value, and have kindly offered to keep these exhibits completely up-to-date.

The Museum will be open to the public and cannot fail to become a centre of propaganda and a guide to methods of safeguarding and improving the health of the people, both at home and overseas.

The Library and Museum of the old London School of Tropical Medicine have served as the nucleus of these developments.

The School, as now constituted, has the following Divisions:—

(1) *Public Health.*—This connotes a very large number of subjects. The term includes not only much that concerns environmental hygiene and the control of infectious diseases but all that relates to the health and welfare of the individual.

Long ago, in the days of the great Napoleon, that remarkable pioneer, Johann Peter Frank, "a modern of the moderns," whose name, with those of twenty other pioneers, has been placed on the façade of the new building, insisted on the importance of personal hygiene and discoursed on maternity and child welfare, the health of the school child and a multitude of other matters which have only engaged our serious attention on a large scale since the beginning of the present century. In this division also there is a section devoted to the physiology of hygiene. In this and in other directions the activities of the public health division will be brought closely into contact with industrial problems and should play a notable part in assisting both the employer of labour and the employed.

(2) *Epidemiology and Vital Statistics.*—The two subjects are closely linked and the division itself stands in close relationship to all the other divisions and should play a great part in training students to become careful observers and recorders, the while it continues to cast light in dark places and to subject the results of research work to the acid test of statistical accuracy.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(3) *Bacteriology and Immunology.*—This, a most progressive division, has already, in temporary quarters, been doing fine work in training men and women who have decided to follow bacteriological careers, both at home and abroad. Its activities in teaching and research will undoubtedly increase in variety and value when housed in new and commodious quarters and provided with all those facilities which modern science demands.

(4) *Biochemistry*, including a Department of Chemistry as applied to Hygiene. It is often said that "the future lies with the biochemist," and there can be no doubt that many of the most important problems in preventive medicine can only be solved by his skilled help. Questions of diet and of growth, of bodily function, of the resistance of the body to disease, these and many other abstruse subjects fall within his purview. The biochemical work will in the main be of a research nature but the Department of Chemistry, while not ignoring research, will be largely concerned with training the public health student in the analysis of water, sewage and food, in the examination of disinfectants, and in the relations which chemistry bears to industry so far as hygiene is concerned.

(5) *Medical Zoology.*—This large division, embracing the departments of protozoology, helminthology and entomology, to which subjects reference has already been made, is, apart from the prosecution of research, chiefly concerned with the training of medical men and women destined for the tropics. At the same time instruction will be afforded students proceeding to degrees and diplomas in public health, to those attending the School at the instance of the League of Nations for the study of malaria, and to others professing one or more of the three subjects abovementioned. An aquarium and large insectarium are features in the equipment of this division.

(6) *Tropical Medicine and Tropical Hygiene.*—This embraces the all-important clinical work in diseases of the tropics for which facilities are afforded by the Hospital for Tropical Diseases, Endsleigh Gardens, now Gordon Street, which, under the auspices of the Seamen's Hospital Society, will continue in close touch with the School.

Associated with this clinical work is the study of applied pathology, as distinct from the pathology of protozoal and helminthic infections. It is concerned largely with questions of technique and is of the utmost importance to the physician practising in the tropics.

Tropical hygiene figures in this division and its study indicates the modifications which the climate and conditions of countries in the torrid zone impose upon the pursuit of the hygienic ideal.

Such is the constitution of the School for teaching and research work. Its staff being in contact with other official research organisations, exceptional opportunities will be forthcoming whereby students may acquire experience of the way in which large scale investigations of public health problems are planned and conducted, while its association with officials of the public health service will ensure adequate practical instruction in field work, both urban and rural.

It possesses an entomological field station at Farnham Royal and, thanks to the Ministry of Agriculture, an Institute of Agricultural Parasitology at St. Albans, which provides opportunities and material for teaching and research work in medical zoology.

On the tropical side it co-operates with the Government of Southern Rhodesia in the work of a field station at Salisbury, and frequently sends members of its staff abroad for purposes of study and research. In its new home it will look forward confidently, provided ample funds for maintenance are forthcoming, to an extension of its work and to the full attainment of the great purpose for which it has been brought into being and which may be expressed shortly, simply, yet adequately, in four words, "the Welfare of Mankind."

THE INDUSTRIAL ANTI-MALARIAL ADVISORY COMMITTEE OF THE ROSS INSTITUTE.

We have received, and read with very considerable interest, the report of the inaugural meeting of the Industrial Anti-Malarial Advisory Committee of the Ross Institute, held on Monday, July 15th, 1929. Representatives of the Ceylon Association, the South Indian Association, the Rubber Growers' Association, and other important industrial concerns in India and Ceylon figure prominently in the list of names of those present. Mr. A. W. Still (Rubber Growers' Association) was elected to the chair; the Advisory Committee was formed, and it was resolved to hold quarterly meetings.

Sir Malcolm Watson then addressed the meeting. The following is an abstract of his remarks:—

Sir Malcolm Watson said that the outstanding fact to-day, thirty years after Ross made one of the most important scientific and practical discoveries in the world, was that only one or two countries had made any use of this discovery, although it afforded a means of controlling the disease which cost more in money and lives than any other in the world.

It is well known that there are many different kinds of mosquitoes which carry this disease. Without an exact knowledge of the habits of these mosquitoes it is difficult to deal with them, and in some cases an impossible task.

In one area, jungle has to be cleared and the disease disappears entirely; in another, jungle must be preserved over streams to control malaria. Water is taken underground in subsoil pipes in one place; and in another open drains suffice. Sometimes it is cheaper to remove buildings than exterminate the mosquitoes which cause the malaria.

In Assam there are three different problems at least. There are swamps which are quite harmless, although they are the winter resort of the bad mosquito. When the rains come the mosquito moves up into nullahs, which were dry in the cold weather. Then they begin to breed and spread the disease. In such places the swamps which appeared dangerous are really harmless, and the harmless-looking dry nullahs are very dangerous. Sometimes the whole of the malaria on a large estate only comes from a couple of little streams, and wide stretches of wet rice land are harmless.

It is still a complicated problem which a very few people really understand. Unless sound advice is available, money and time can easily be wasted carrying out unnecessary work and leaving the really dangerous places.

The Malaria Department was hung with plans, diagrams, maps and photographs, and as each problem was mentioned Sir Malcolm referred to the corresponding exhibits.

He continued: In India many medical men still believe that it is quite impossible to control the mosquito economically anywhere; and that has been the accepted opinion until recently.

In Assam comparatively little has been done, although the disease is widespread and destructive. The remedy is to get estate doctors, Managers, Engineers, etc., to come to the Ross Institute when on leave, and learn what can be done to control malaria. Already three men are working here and going through a practical course of malaria control, and a number of others have arranged to come.

Sir Malcolm Watson then outlined the practical course he proposed to give at the Ross Institute. He advised members to send their men to the Malaria Department of the Ross Institute to acquire this practical knowledge. It has taken considerable time to work out the many problems of malaria control in different countries. The Institute is now able to offer advice based on that knowledge in many cases. It is desirable that men should bring with them plans of their estates, statistics, etc., to facilitate the solving of their problems. Finality has by no means been reached, and the more difficulties that are brought to notice the more we shall learn. It is the aim of the Institute to have experts in the Tropics who can go out and advise industrial concerns on the spot.

One of the things that made for the success of malaria-control in the Federated Malay States was that the Malaria Advisory Board would not approve of any

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

expenditure unless a proper scheme was put up. He intended to follow up the same policy at the Ross Institute.

Mr. G. H. Masefield said that a few years ago he visited the Federated Malay States, and was amazed to find places which in Ceylon it would be impossible to live in free of malaria. When he was Chairman of the Ceylon Association in London he wished to bring home to the members how far Ceylon was behind the Federated Malay States. At that time Sir Ronald Ross offered to go out to Ceylon on malaria-control. The result of his visit was very satisfactory, and created much interest, and the planters were now working together for the common good. The Ross Institute could help to supply knowledge, and instruct men to whom planters could turn for information and advice, then malaria-control in the East will only be a matter of time.

Sir Malcolm Watson explained that, as, except in a few places, little anti-malarial work had been done, there were few men with practical experience who could advise. He mentioned places where good work had been done.

The Executive Committee had arranged a subsidy for certain men who were doing special work in malaria-control in the tropics. Malaria-control is not necessarily a question for the medical man, but for the entomologist and the engineer. Local Committees should be formed, and these would send their problems home to the Central Advisory Committee.

Mr. Crosbie Roles raised the question of controlling malaria in Bengal, and Mr. Still suggested that Governments, when making appointments, should require that a certain percentage of their men who have already had a general training should have some practical training, such as might be obtained at the Ross Institute. When it came to the question of individual estates, good health is one of the most vital and important factors of success. Those in control require just that guidance which is wanting at present, and which might most advantageously be given under the proposals which have been made. If Companies can be persuaded that it would be to their advantage to send their men to the Ross Institute for a three months' course, to acquire knowledge to enable them to detect the actual nature of the trouble, then they would repay themselves tenfold for their expenditure.

Sir Malcolm Watson stated that he proposed that this Committee would direct its energies principally to industrial concerns. As regards Governments, some officers had already arranged to come to the Institute. Any Government doctor or official is welcome at the Ross Institute, either to obtain advice in the Malaria Department or to have free facilities to use the research laboratories, and he hoped Governments would take advantage of this.

Mr. Mackie asked how long it would take to give estate managers the necessary instruction.

Sir Malcolm replied that useful knowledge could be acquired in three months, but that even in a week much valuable information could be gained. It would be advisable for men to come in groups.

In addition to photographs and plans, the Institute has the equivalent of 15,000 feet of standard film, illustrating malaria-control throughout the tour just made in India, Assam and Ceylon.

Speaking of malaria in Bengal, Sir Malcolm said that it is only within the last 70 years that malaria had spread in a severe form in Western and Central Bengal. There are two opinions as to the cause of the disease. One that the embankments prevent flooding, which is Nature's way of controlling mosquitoes there. This party says that embankments must be removed. The other opinion is that embankments are necessary, and drainage, not flooding, is required. Bengal will follow the way of Ceylon if something is not done soon to control malaria. Two-thirds of Ceylon is now uninhabitable on account of malaria.

(Whilst we cordially wish the Ross Institute every success in its endeavours to arouse interest in malaria-control in the tropics, we do not think that conditions in Assam and Bengal are quite as black as Sir Malcolm Watson makes them out to be. The crux of the matter, of course, is want of money; not the want of trained malariologists. The very successful campaign against kala-azar in Assam means that there is but little money available for anti-malaria measures; and the same is true, to a less extent, in Bengal.

Yet there is much malaria-control going on in Assam. There have been very successful schemes introduced by the Public Health Department of that province at Lumding and Pasighat, whilst the Eastern Bengal Railway employs the services of a malariologist, Captain Chalam. On the tea gardens the work of such medical men as Dr. Ramsay in Cachar, Dr. Murphy in South Sylhet, and Dr. Williams of the Assam Frontier Tea Co. in the Upper Assam valley all shows what can be done in the way of malaria-control on the tea gardens. The Indian Tea Association are very fully awake to the importance of this problem, and have shown every intention of financing anti-malaria measures. Dr. Strickland's surveys of malaria in the Assam tea gardens and in the Duars have given a general outline of the problem and of the measures necessary.

In Bengal, apart from the important work of the Co-operative Anti-Malarial Societies (with which Sir Malcolm Watson is familiar), there is excellent work being carried out by the Malaria Department of the Public Health Department. We have recently perused no less than thirteen reports on various malaria surveys carried out in Bengal within the last two decades. One of the most strikingly successful malaria-control schemes was that carried out during the construction of the Sara Ghat bridge—one of India's greatest engineering feats—where the main line of the Eastern Bengal Railway crosses the treacherous bed of the Ganges. There is nothing about this work in the journals, but the fact remains that most successful measures were taken to control both malaria and cholera among the labour force employed. Further south, the new construction by the Bengal-Nagpur Railway of a line from the Central Provinces to Vizagapatam in connection with the construction of a new first class harbour at the latter port would have been impossible without the services of a malariologist (Mr. R. Senior White). An account of the malaria problem in connection with this scheme was published in our columns in 1928 by Mr. Senior White.

Further, our readers must be well aware of the classes of training in field work in malaria held by the Malaria Survey of India at the Ross Experimental Field Station at Kurnal; whilst there is to be a chair in malariology in the new Rockefeller Institute of public health in Calcutta. The trouble is not that India has no facilities for training men for malaria-control in the field—the contrary is the case; but that funds are lacking).

THE BRITISH SOCIAL HYGIENE COUNCIL.

The British Social Hygiene Council announces that Mr. L. S. Amery, M.P., has accepted the Chairmanship of its Imperial and International Committee, which besides co-ordinating and disseminating information and experience on matters relating to venereal diseases, also interests itself in the study of the scientific foundations of Social Hygiene as related to the different conditions of the Empire.

Following immediately upon the conclusion of the Fourth Imperial Social Hygiene Congress which was held in London last July, Mr. Amery's acceptance of this position will mark a very definite step in advancing the study of the social hygiene problems which present themselves in an extraordinary variety of ways to health and education administrators, missionaries and other social workers throughout the Empire.

The desirability of providing them with a knowledge of the subject before they go abroad, and with facilities for keeping abreast with the latest developments and methods of approach has been recognised. In this connection a diploma course has been instituted at Aberystwyth University, and in the near future courses will be established at other universities.

Mr. Amery, when in office, keenly interested himself in bringing these facilities to the notice of the Colonial

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Governments, suggesting that they should offer scholarships for the purpose. Definite steps have also been taken by the Council to secure the extension of preparatory courses available to Colonial officials before proceeding overseas to take up their positions.

A further development has been the establishment of a Joint Committee of the British Social Hygiene Council and the Board of Study for the Preparation of Missionaries, with a view to equipping those who are about to enter the missionary field, or are on leave at home, with opportunities of acquiring scientific knowledge of the subject.

The proceedings of the Imperial Social Hygiene Congress this year emphasised the need for the creation of a biological general staff for the Empire to think out and direct research and inquiry, not only into national resources but also into the development of the health and well-being of the diverse races within the Empire.

BENGAL COUNCIL OF MEDICAL REGISTRATION.

THE Council have found Dr. Sailendranath Mitra, M.B. (Register No. 3187) guilty of infamous conduct in a professional respect and have directed that his name be erased from the register of registered practitioners maintained under the Bengal Medical Act, 1914. They will be ready to consider an application for the restoration of his name to the register should it be made a year after the date of their decision, viz., the 25th July, 1929.

THE ROYAL INSTITUTE OF PUBLIC HEALTH, LONDON.

So many medical men from India nowadays proceed to Great Britain to take out a Diploma in Public Health that the recently published syllabus of the course of instruction for 1929 at the Royal Institute of Public Health, 37, Russell Square, London, W.C. 1, may be of interest to some of our readers.

The following is a résumé of the scope and work of the Institute, taken from the syllabus.

In view of the claims being made elsewhere which may lead to misconception as to the national and international position held by The Royal Institute of Public Health, the Council of the Institute think it necessary in justice to the Fellows, Members and Associates, who have for so many years supported its work and made its continued advancement possible, to make a brief statement as to its position.

The Royal Institute was the first, and has been for many years the only, central school for teaching and research work in all branches of preventive medicine, for the training of post-graduate students, and especially of students proceeding to Degrees and Diplomas in Public Health. The institute has been in active operation since 1886 and was instrumental in securing for the nation that adequate foundation upon which the public health services of the country now rest, and particularly in 1888 securing that a full qualification in public health must be held by all Medical Officers of Health of districts with 50,000 or more inhabitants, and that a detailed and uniform curriculum should be prescribed for use by the General Medical Council for practically all examining bodies. The qualification was subsequently rendered necessary for all such appointments in Scotland, and indeed to-day, no appointment in the Public Services at home or abroad of a public health character can be obtained by a candidate without its possession.

There existed in London at that time no central school for complying with the provisions of this curriculum and the Council of the Institute acquired and adapted the present premises for the purpose. The bacteriological and chemical laboratories are recognised as amongst the best equipped in London. The Lever Museum, added through the generosity of the late Viscount Leverhulme, a lecture room, a reference library and a common room are other features.

The provision thus made for complying in all respects with the regulations was recognised by all the Universities and Medical Colleges as fully qualifying candidates for admission to the examinations for Degrees and Qualifications in Public Health. From 1905, when the training courses opened, to 1929 no fewer than 829 students have entered and many of the Institute's successful students fill Public Health appointments of the first importance in all parts of the world.

Of the candidates presenting themselves for the Examinations for the Diploma in Public Health the average number of successes is 84 per cent.

The international position of The Royal Institute of Public Health is evidenced by the series of Annual Congresses which have been held under its auspices in Great Britain and Ireland and in the leading Continental cities. Amongst the foreign cities thus visited may be mentioned Berlin, Paris, Brussels, Bordeaux, Ghent and Zurich.

Amongst the awards at its disposal, are the Harben Gold Medal and the Harben Lectureship, which are bestowed by the Council irrespective of nationality. Amongst the recipients of the former are Simon, Pettenkofer, Lister, Koch, Metchnikoff, Behring, Roux, Gorgas, Kitasato, Pasteur and Ronald Ross, and the Harben Lectureship has been held by Klein, Woodhead, Calmette, Gruber, Ronald Ross, Metchnikoff, Ehrlich, Nuttall, Pfeiffer, Uhlenhuth, Flexner, Bordet, Vaillard, Houston, Madsen, Levaditi, Topley, etc.

The Council of the Institute look forward to the continuation and development of its work for the advancement of knowledge in the great field of public health, the training of workers entering that field, and the bringing together for co-operation and conference of those already engaged in it both at home and abroad.

The Council have recently acquired a site in a commanding central position in close proximity to its present building, where it is proposed, to erect a more commodious building worthy of the Institute's international position and increasing usefulness.

REGULATIONS FOR DIPLOMA IN PUBLIC HEALTH.

(*Adopted by the General Medical Council, May 22, 1922*) *which came into force January* 1, 1924.

Under the Regulations the Course of instruction must cover at least twelve calendar months subsequent to obtaining a registerable qualification, and must include:—

PART I.

Laboratory Work and Practical Instruction (during a period of not less than five months) in:—

A. Chemistry and Physics (at least 90 hours), of which 70 hours shall be occupied in practical laboratory work.

Meteorology and Climatology (at least 10 hours).

B. Bacteriology and Parasitology (at least 180 hours), of which 150 hours shall be occupied in practical laboratory work.

PART II.

C. Instruction in:—

Principles of Public Health and Sanitation (at least 30 hours).

Epidemiology and Vital Statistics (at least 20 hours).

Sanitary Law and Administration (at least 20 hours).

Sanitary Construction and Planning (at least 10 hours).

D. Work with M.O.H.

Every candidate shall produce evidence that he has been engaged in acquiring a practical knowledge of the duties, during a period of not less than six months, routine and special, of Public Health Administration under the supervision of a Medical Officer of Health, who shall certify that the candidate has received, from this Officer or other competent Medical Officer, during not less than three hours on each of sixty working days, practical instruction in these duties, and also those relating to:—

(*a*) Maternity and Child Welfare Service.
(*b*) Health Service for Children of School Age.
(*c*) Venereal Diseases Service.
(*d*) Tuberculosis Service.
(*e*) Industrial Hygiene.
(*f*) Inspection and Control of Food, including meat and milk.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Certificates of having received the prescribed instruction in Public Health Administration must be given by a Medical Officer of Health who devotes his whole time to public health work; or by the Medical Officer of Health of a sanitary area having a population of not less than 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

The following are the names of the professorial staff of the Institute:—

Principal.—Col. Sir W. R. Smith, M.D., D.SC., D.P.H. (Camb.), F.R.S.E.

Chemistry.—Dr. A. W. Stewart, D.SC., A.I.C.

Applied Bacteriology and Immunology.—Dr. E. G. Rawlinson, M.D., D.P.H. (Oxon.).

Hygiene and Sanitation.—Dr. A. E. Thomas, M.A., M.D. (Oxon.), D.P.H. and Dr. G. E. Oates, M.D. (Lond.), D.P.H. (Camb.).

Public Health Administration.—Dr. C. W. Hutt, M.A., M.D. (Camb.), M.R.C.P., D.P.H. (Oxon.).

Port Sanitary Administration.—Dr. C. F. White, M.D., D.P.H., D.T.M., Medical Officer of Health to the Port of London.

Meat Inspection.—Mr. C. Slatter, Inspector, Smithfield Market.

The Harben lectures for the year are to be given by Dr. R. A. Peters, M.A., M.D. (Oxon.), whilst a special series of ten lectures by eminent authorities on problems of personal and public health is also to be given during the session.

As will be seen, the staff of the Institute is a very strong one, and medical men from India desiring to take out a Diploma in Public Health in Great Britain might do well to write for the full syllabus.

Current Topics.

Notes on Fractured Patella.

By A. P. BERTWISTLE, M.B. (Leeds), F.R.C.S. (Edin.). (*The Lancet*, Vol. CCXVI, June 29th, 1929, p. 1349.)

FRACTURES of the patella may be classified in two main groups according to their causation and treatment, viz., those due to direct violence, and those caused by muscular action. Whilst all are in agreement about the treatment of the former, that of the latter is by no means standardised. This is all the more surprising, as the patella was the second of all bones to be wired, and this procedure gives as good results as any other of its class. The olecranon was the first bone to be wired, and to Lister, who performed this operation, is also due the credit of wiring the patella, though Cameron preceded him by a year in 1876. In the eyes of his rivals it was Lister's boldest surgical effrontery. P. Turner recently reported a case operated upon by Howse 38 years ago; he probably used the carbolic spray and kept the limb on a back splint for six weeks. At that time Malgaigne's hooks were considered effective, but the pain and irritation they caused led to their abandonment.

Fracture from Direct Violence.

Fractured patella may occur in several members of the same family and refracture at the same or a different place is not uncommon. Both these facts suggest a congenital weakness. Bilateral fracture, of which I have seen an example, is not uncommon. Direct violence usually causes a starred fracture by crushing the patella against the femur, though transverse and longitudinal breaks are not unknown. The front of the joint becomes extremely swollen, partly from bruising, and partly from distension of the prepatellar bursa. It is only later that the joint itself becomes distended. Some movement is possibly immediately after the accident; effusion prevents it later. The aponeurosis and lateral expansions are not divided, and hold the fragments in position. The fracture may be simple or compound. Lateral plaques are usually found at the upper and outer angle of the bone and are often bilateral, a point of considerable diagnostic importance. I have seen one, and Skudder depicts several. The discovery of these plaques after an accident may present considerable confusion, and the symptoms may be due to injury to them.

(*a*) *Simple Fracture.*—All are agreed that it is inadvisable to operate on the starred fracture. The first essential is to reduce or at least arrest the swelling by an elastic bandage or firm bandaging over wool; evaporating lotions are of some service. A moulded back splint or a calliper is applied so that the limb can be elevated to an angle of 45°, to relax the rectus femoris, which is more or less taut when the limb is in line with the body. Massage is applied daily to the quadriceps, which otherwise wastes rapidly. No active movement is permitted for three weeks, but passive movement should be recommended, or the clots and effusion organise into strong bands which may require open operation. The patient walks with a calliper which permits slowly increasing range of movement after the third week.

(*b*) *Compound Fracture.*—Fracture from direct violence may result in a compound fracture with a lacerated or punctured wound; the latter is liable to be overlooked, suppuration being the first indication of it. All compound fractures should be explored under anæsthesia and the wound carefully excised.

The immediate *prognosis* is good, bony union being the rule. There is, however, a liability to arthritic changes, since the joint may have been injured as well as the patella.

Fracture from Muscular Action.

By far the commonest accident is for the patient to have imagined a non-existent step while walking upstairs; he jerks his leg forward and collapses, so that the break occurs with the limb flexed. Lister's cases all occurred whilst the patient was in the act of extending the limb to prevent a fall. Immediately after the accident inspection reveals between the fragments a gap which is well seen in the silhouette-radiogram. Power to extend the leg is almost if not completely lost, though it may be possible to walk by swinging the leg forward and hyperextending (Cotton). Effusion of blood and synovial fluid cause the joint to be distended earlier and to a greater extent than in the other variety of fracture.

The fracture is usually a clean, transverse one associated with a variable amount of laceration of the lateral expansions; the greater the laceration the wider the separation. A very important feature is that the aponeurosis over the patella tears at a different level from that of the fracture and comes to dip down over one fractured surface; crepitus, if felt, is therefore soft. The gap may be anything from ½ in. to 3 in. The lower fragment is usually tilted, so that its fractured surface is directed anteriorly.

The *differential diagnosis* is from: (1) dislocation; a radiogram clears up any doubt. (2) Ruptured ligamentum patellæ; the ligament is rarely ruptured, but usually evulses a flake of the tibial tuberosity, which is well seen in the radiogram, together with the wide separation of patella from tibia. (3) Torn quadriceps; a rare condition differentiated radiographically.

Treatment.

The knee-joint has the largest area of synovial membrane and the greatest number of vitally important ligaments of any joint in the body. It possesses the largest amount of avascular tissue in the form of cartilage. Its poor bony architecture and its exposed position favour synovitis, which may go on to arthritis; in fact, it is the commonest joint to suffer from these conditions. Draining the joint is fraught with danger to itself if not to life. An ankylosed knee is a most crippling deformity.

Two methods of treatment are in use, the conservative and the operative. Most surgeons would not operate unless the gap is very small, as only after operation can bony union occur. The aseptic surgeon of to-day does not consider that the behaviour of the patella differs from that of any other bone after operation. Pre-Listerian results of operation, especially on long-standing cases, surrounded the patella with an evil reputation which is not yet dissipated.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*a*) *Conservative Method.*—From the start the limb is put up in the same position as has been described for the starred fracture. Means are taken to reduce the swelling. Some authorities use two loops of bandage, applied above and below the fracture, to maintain apposition, but these are not satisfactory and may cut the skin. Skudder's figures are probably as good as any, and yet he only secured 66.5 per cent. of serviceable limbs in six patients not treated surgically, whereas he had good results in 84.5 per cent. of operations; he does not say why some were operated upon and others not. Sir William deCourcy Wheeler records a perfect result with wide separation. Possibly the poor results are due to failure to elevate the limb during treatment.

(*b*) *Operative Treatment.*—The after-treatment is very much simpler and saves a considerable amount of time but—what is still more important—operation ensures bony union in most cases and, even if there is a gap, it is of little functional disadvantage. The objections were the fatalities and complications of pre-aseptic days. The former have almost disappeared; the latter are still with us and may be attributed to:—

(1) Faulty preparation of the skin. The whole limb from buttock to toes should be prepared with spirit soap and antiseptics for three days. Fomentations are useful for the rugæ around the knee. At the time of operation there should be no eczema or blisters, since the latter teem with micro-organisms. To operate immediately is risky.

(2) Unnecessary trauma. It is frequently observed that a surgeon who cuts and is gentle, yet not overfastidious as regards asepsis, gets results which compare favourably with those of one who tears and is rough, but who is scrupulously aseptic. One of the advantages of operation is the possibility of removing clots, but this must be done with the greatest gentleness with forceps and isotonic saline irrigations and not with gauze, since this tends to damage the cartilage and may cause the entrance of bacteria. A joint is well able to remove clot, as is seen in hæmophilic effusions. Trauma is very important in dealing with long-standing fractures.

(3) Devitalisation of the patella. Erichsen describes some dissections performed by Manning which demonstrated that the vascular arch supplying the patella was torn across the internal condyle. This cutting-off of the blood-supply explains the formation of sequestra in unopened fractures, of which Erichsen cites a case. Still more important is its bearing on cases where these form after operation. This devascularisation makes the patella an easy prey to sepsis.

Steps in the Operation.

(1) *Time of operation.*—Probably the fourth is the ideal day; the first should be devoted to reduction of swelling.

(2) Application of a *tourniquet.*—This useful measure is sometimes omitted. If any vessels are seen they can be ligatured; a firm dressing suffices to arrest capillary and venous hæmorrhage.

(3) *Flaps.*—These are horse-shoe shaped; if they are turned up their vitality may be better secured, but if they are turned down the resulting scar is outside the pressure-bearing area of the knee.

(4) After raising the flaps it is imperative to *change gloves* or, better, to remove the outer of two pairs worn at the start.

(5) *Tetra-cloths* must be arranged to prevent skin contamination.

(6) The field must be cleared of *blood-clot* and as much as possible removed from the joint with forceps and saline irrigation. Tags of tissue which are of no use for suture are removed.

(7) *Wiring.*—The number of methods in use is legion, suggesting that the ideal is yet to be sought, but Hey Grove's original method fulfils all that is necessary. Two wires are passed transversely and the ends twisted. If trouble arises later, all that is required is an incision over each twist, cutting the twist on one side and removing the rest of the wire. Surgeons generally advise that, if the lower fragment is too small, the wire should be passed through the ligamentum patellæ, and this was actually found necessary in one of Lister's cases. It is in any case much better to introduce one wire through the ligament or rectus expansion, for this makes it much easier to correct any angulation without re-drilling. This tissue, moreover, resents a foreign body far less than such a vital structure as bone. A suture passing into the joint was once used, but no joint will stand such an insult.

(8) *Elevation of the limb.*—This is a most useful manœuvre at the time of twisting the wire and one which, in a recent case at the Wembley Hospital, obliterated a gap of 1 in. with ease.

(9) *Suture of periosteum* over the patella.—Some surgeons, including Sir Robert Jones, rely entirely on suture of the periosteum and lateral expansions, but the omission of wiring precludes early movement.

(10) *Suture of the lateral expansions and tear in the capsule.*—This is of the greatest importance.

(11) *Suture of the skin.*

(12) A firm, bulky *dressing* arrests hæmorrhage and effusion and restrains movement. Some surgeons use a back-splint until the patient is round from the anæsthetic.

(13) *Removal of the tourniquet.*

After-treatment.

On the third day a less bulky dressing is applied and massage to the quadriceps is commenced. All dressings are removed between the seventh and tenth days, when the wound should be healed. The patella may with advantage be moved on the femur to prevent adhesions. The patient is allowed to walk with a stick after two or three weeks and should be able to resume his former occupation in three months.

It was observed during the late war that fractures united more quickly in the south of France, where it was warm, than in the north. Recently I have tried radiant heat for fractures; the patients were pleased and one case, where union had been delayed, united rapidly under heat.

Wire v. *absorbable suture.*—This is a very controversial subject. Wire permits early movement, which most surgeons consider advisable, though some, including Sir Robert Jones, keep a fractured patella six weeks on a back splint. Against the advantage of strength is the fact that wire is not well tolerated by some patients and may have to be removed or it may break months after insertion. Kangaroo tendon is good but scarce. Autogenous grafts, first used by Golding Bird, are awkward to use and lengthen the time of operation. Stout catgut possesses little tensile strength after a week.

Old Fractures.

To quote Lord Lister, "the ununited case is in every respect worse as a subject for treatment than the recent one." It is these cases which account for many of the failures of operative treatment. It is imperative to freshen the ends by sawing off a flake of bone, so introducing the all-important element of trauma. In addition to lengthening of the ligaments, there is often marked wasting and contracture of the quadriceps. The contracture may be so marked that the operation has to be performed in two stages, the first aiming at reducing the separation as much as possible with the limb elevated, subsequently allowing it to be lowered for a week or so. The second consists of making apposition. In severe cases the rectus femoris or even the quadriceps may need incisions to lengthen them. Extreme old age, debility, and infective conditions are the only strong contra-indications. Spinal or regional anæsthesia can be used where necessary. The outlook for diabetics has been completely changed since the advent of insulin and a properly controlled diet.

Summary.

(1) Starred fractures should be treated on conservative lines, elevating the limb to an angle of 45°.

(2) Transverse fractures with separation are best treated by operation.

(3) Complications and deaths after operation are due to sepsis caused by (*a*) faulty preparation of the skin, and (*b*) unnecessary trauma. They are predisposed to by devascularisation of the patella.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(4) Hey Grove's method of using two transverse wires is the ideal one.
(5) Elevation of the limb at the time of securing the twist is most helpful.
(6) Old fractures account for most of the poor results.

The Medical Management of a case of Gastric or Duodenal Ulceration.

By JOHN H. ANDERSON, C.M.G., C.B.E., M.D. (Melb.), (*The Lancet*, Vol. CCXVI, June 29th, 1929, p. 1347.)

In days gone by medical measures were employed exclusively in the treatment of gastric ulcer, and though gastric surgery has advanced greatly in recent years, medical treatment has lost nothing of its importance whether or not it is combined with surgery.

Medical treatment can be divided into: (*a*) feeding entirely by the bowel, or (*b*) a graduated diet, with alkalis, by the mouth. The latter practice is the routine adopted at Ruthin Castle. Essentials for medical treatment are: (1) co-operation of the patient, (2) removal of septic foci, (3) rest, (4) diet, (5) alkalis.

Co-operation of the Patient.

When the diagnosis is established the patient is told that this disease may be treated medically or surgically, and unless there is some feature calling for surgery medical measures are advised. It is stipulated that a reasonable time be given for treatment, otherwise it is feared that the result will not be satisfactory to patient or physician. Three months is suggested as the minimum time required, of which the first month is spent in bed, about a month getting up and about, and a third month for a general return to active life. For the first two months institutional treatment is to be preferred; for it has been our experience that treatment undertaken at home is not so successful as that carried out under the constant supervision which is possible in a hospital. The diet also calls for a care and precision which it is difficult to organise in a private house.

For example, a man of 37 preferred to carry out treatment at home when he could attend to his work with the help of a telephone by the bedside and daily visits from a stenographer and his works manager. All symptoms ceased, but the anæmia did not improve and *x*-rays two months later showed no change in the gastric lesion, a small pre-pyloric ulcer.

During his time in bed an attempt is made by daily talks to get the patient to understand the reason for the various points in his routine, with a view to shaping his life after he leaves hospital. Lawrence has ably described the "diabetic life," and we attempt to lay down in these cases what may be called the "ulcer life," pointing out where dangers lie and emphasising the need of careful supervision by his medical attendant, and of a permanent routine after leaving hospital.

Removal of Septic Foci.

If not already done, the body is searched for sources of infection. In this quest mouth, throat, tonsils, nasal sinuses, teeth, bowel, gall-bladder, kidneys, and urinary bladder are systematically gone over and any lesion dealt with as far as possible. The importance of this procedure cannot be stressed too highly. If in this connection laparotomy is required, the opportunity is, of course, taken to examine the ulcer and carry out any further surgical procedure that seems desirable. We have seen the removal of a septic focus, such as a chronic appendicitis, lead, with medical treatment, to a permanent healing of a gastric ulcer without any deforming or crippling operation on the stomach. Even when the collaboration of a surgeon has been sought, and the case dealt with in the first instance by him it is felt that when the surgical condition has been relieved, the medical after-treatment should be in the hands of a physician.

Rest.

The whole body is rested by at least four weeks in bed, lying on the back, shoulders flat on the bed, and head raised by one or two small pillows. Daily massage helps to keep up the muscular nutrition and to avoid the cramps and aches which otherwise so often occur, particularly in the first two or three days in bed, and later about the end of the second week. The stomach is rested by frequent small meals as indicated under "diet." Aperients are avoided, and at first an enema is given on alternate days. At a later stage liquid paraffin is added and, as a rule, before the patient is getting up the bowels are acting naturally.

Diet.

In former days fasting or rectal feeding was the routine method. The present method is a modified combination of the diet of Lenhartz, and the olive oil of Cohnheim and Walko. The régime cannot be applied as it is set forth to every, probably not to any, patient. Each case requires individual care and inquiry with resulting modification of the instructions.

The diet is graduated in 26 steps, starting with olive oil and alkaline water and working up gradually to a light diet. The best idea of it may be given by setting out three or four stages.

Diet on First Day.

(30 c.cm. = one ounce.)

8 a.m.	..	..	15 c.cm. of olive oil.
9 „	..	..	60 c.cm. of alk. water.
11 „	..	..	15 c.cm. of olive oil.
12 noon	..	..	60 c.cm. of alk. water.
2 p.m.	..	..	15 c.cm. of olive oil.
3 „	..	..	60 c.cm. of alk. water.
5 „	..	..	15 c.cm. of olive oil.
6 „	..	..	60 c.cm. of alk. water.
8 „	..	..	15 c.cm. of olive oil.
9 „	..	..	60 c.cm. of alk. water.
10 „	..	..	15 c.cm. of olive oil.

Food value = 770 cal. approximately.

A few patients cannot take olive oil at all, and in this case a milk cream mixture is substituted for the oil. This is made by mixing 180 c.cm. of milk, 60 c.cm. of lime water, and 60 c.cm. of cream. The alkaline water is made up of 15 grammes of bicarbonate of soda in one pint of water, and an extra 30 c.cm. is allowed between the olive oil feeds if the patient desires. It has been found possible to start gradually a diet of this nature three or four days after a hæmorrhage.

Diet on Third Day.

This consists of egg and milk mixture three-hourly with a dose of olive oil an hour before each feed.

8 a.m.	..	..	30 c.cm. of olive oil.
9 „	..	..	30 c.cm. of olive oil.
11 „	..	..	50 c.cm. of e.m. mixt.
12 noon	..	..	30 c.cm. of olive oil.
2 p.m.	..	..	50 c.cm. of e.m. mixt.
3 „	..	..	30 c.cm. of olive oil.
5 „	..	..	50 c.cm. of e.m. mixt.
6 „	..	..	30 c.cm. of olive oil.
8 „	..	..	50 c.cm. of e.m. mixt.
9 „	..	..	30 c.cm. of olive oil.
10 „	..	..	50 c.cm. of e.m. mixt.
			30 c.cm. of olive oil.

Food value = 1790 cal. approximately. E.m. mixt. = egg and milk mixture.

The egg and milk mixture consists of one egg in 100 c.cm. of milk, is taken in sips, and if possible is made to last from one dose of olive oil to the next. Alkaline water is provided and sips are taken when required for thirst at intervals of not less than 15 minutes. The olive oil is gradually reduced and the egg and milk mixture increased. On the seventh day boiled rice is added, and on the eighth day minced or pounded chicken.

Diet on Twelfth Day.

Here four meals are given, olive oil before the two chief ones, and extra feeds of egg and milk at 2 p.m. and 9 p.m. 30 g. = one ounce.

Breakfast, 8-30 a.m.—One egg; dry toast (25 g.); butter (10 g.); milk and water (100 c.cm.).

11-30 a.m.—30 c.cm. of olive oil.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Lunch, 12 noon.—Minced or pounded beef (56 g.); dry toast (20 g.); butter (5 g.).

2 p.m.—Egg and milk mixture (150 c.cm.).

Tea, 4 p.m.—Thin bread and butter (20 g.); milk and water (170 c.cm.).

6-30 p.m.—30 c.cm. of olive oil.

Dinner, 7 p.m.—Boiled rice (30 g.); milk and water (100 c.cm.); dry toast (20 g.); butter (5 g.).

9 p.m.—Egg and milk mixture (150 c.cm.).

Food value = 1930 calories approximately.

The alkaline water is still allowed for thirst. The milk and water mixture consists of 55 c.cm. of milk and 35 c.cm. of water. The allowances are increased gradually, as is shown by the diet on the twentieth day.

Diet on Twentieth Day.

Much the same as the preceding, but with more variety.

Breakfast.—Egg or fish; dry toast; butter; milk and water.

11-30 a.m.—30 c.cm. of olive oil.

Lunch.—Chicken; mashed potatoes; dry toast; butter; rice pudding; milk and water.

2 p.m.—Egg and milk mixture.

Tea, 4 p.m.—Dry toast or dried bread and butter; sponge cake; milk.

6-30 p.m.—30 c.cm. of olive oil.

Dinner, 7 p.m.—Steamed fish; toast and butter; macaroni or vermicelli; milk pudding or custard; water or soda water.

10 p.m.—Milk and rusk or Bengers' food.

Food value = 3000 calories approximately.

If pain or discomfort recurs the diet is kept the same for a day or two or is taken back to an early stage, and increased again later.

As the patient gets up, more foods are added, and the diet on leaving is made up as follows:—

Diet on Leaving.

A light ordinary bland diet.

Breakfast.—Porridge, fish, cold fat ham, egg; toast; butter; cream; flavoured milk or weak China tea.

Lunch.—Chicken, mutton, or lamb; potato; sieved greens; milk or light steamed pudding; cream; sieved fruit.

Tea.—Bread and butter; sponge cake; milk and water or weak tea.

Dinner.—Fish, chicken or sweetbread; potato; sieved greens; macaroni or vermicelli, milk pudding, cold sweet, sieved or puréed fruit; toast; butter; cream.

It must be repeated that in all cases variations are necessary to meet personal likes and dislikes and ingenuity is often severely taxed. It is surprising, however, how few failures there are in keeping fairly close to the desired diet if patience, tact, and humanity are displayed in the dealings between doctor and patient. Visiting at meal times is often a great help.

Alkalis.

Various alkalis are used, such as sodium bicarbonate, sodium citrate, cremor magnesiæ, magnesium carbonate or hydroxide, and calcium carbonate. Bismuth oxychloride is generally given three times a day in water as a routine; sodium bicarbonate is in the alkaline water which the patient takes steadily throughout his time in bed, and the other drugs are used from time to time as required. The magnesium compounds are especially useful if constipation is a feature, and the cremor magnesiæ if gastric flatulence is a leading symptom. The well-known combination of the carbonates of bismuth and magnesium and the bicarbonate of soda should be specially recalled. Another useful powder is one made up of equal parts of bismuth oxychloride, sodium citrate, and mag. carb. lev., one teaspoonful as a dose three times a day after meals in water. If there is any looseness of the stools calcium carbonate is substituted for the magnesium carbonate. No case of alkalosis has been seen.

General.

While in bed the mouth is cleaned after each feed, and sleeping helped when required with small doses of medinal or dial ciba. If wakefulness is complained of, a small feed through the night is often more useful than a hypnotic. Smoking is discouraged.

Progress.

Progress, as a rule, is uneventful and is checked by: (*a*) disappearance of symptoms; (*b*) examination of stools for blood, visible and occult; (*c*) radiography of the stomach. The pain gradually eases and, as a rule, is gone by the sixth to seventh day, though intermittent discomfort may be present for a few days longer. If pain is still prominent by the end of the second week, the case is reconsidered in all its bearings with a view to deciding whether medical treatment should be continued or surgery advised. At this time of alleviation of symptoms it is advisable to point out to the patient that his improvement does not mean a cure, but is merely an indication that cure would appear to be possible and even probable. He is told that the "ulcer is skinning over," but that time must be given for the new covering to become several cells thick. Histological work has shown that this process takes a long time; and it cannot be hastened. A useful analogy can be drawn between the healing of the internal ulcer and the gradual scarring of a deep abrasion of the skin. Blood disappears from the fæces at an early stage of healing, and the later progress can be judged from an *x*-ray photograph of the ulcer site. The diet is steadily increased as has been shown, and more latitude of movement in bed allowed, and finally the patient is allowed to get up in a chair and out of doors as weather permits. Walking is carefully graduated, and violent exercise prohibited. He is cautioned that absence of symptoms does not mean that liberties may be taken. Lord Moynihan has stated the position in his aphorism that "clinical silence does not mean pathological inactivity," and this point is emphasised to the patient as clearly and as forcibly as possible. A normal life, with certain limitations, is resumed gradually, and on leaving hospital some simple instructions are given, in addition to the suggested diet as already described.

Example of Instructions.

The diet should consist of simple foods, avoiding beef, pork, pastry, vinegar, pickles, twice-cooked foods, and foods containing shreds and hard pieces. Hot fats and raw fruit should be taken sparingly, and all fruit and greens should be passed through a sieve.

For the present rest a full hour in the middle of the day and in the evening. Bed not later than 10 p.m.

Exercise daily in the open air, increasing the time gradually, but not to the point of fatigue.

The return to work should be gradual; at first not more than two hours a day, gradually increasing as strength is regained. Work should be so planned as to avoid long-continued effort or hurry. Enough time must be allowed for meals.

Alcohol is not advised. Smoking is not advised for the present, and when resumed should be limited to the half-hour immediately after a meal.

Continue the liquid paraffin, dose modified as required, and the olive oil before meals. Half a teaspoonful of bicarbonate of soda or of the prescribed powder, in water, should be taken an hour after meals.

The return to full strength will be gradual and no alteration in the régime must be made without medical advice.

Results.

The method of treatment here described has been used at Duff House and Ruthin Castle for 15 years, and has yielded good results in cases of gastric and duodenal ulceration in which there is no direct call for surgery.

In cases with much pyloric or duodenal deformity, those in which symptoms persist after a fair trial of medical measures and, above all, those with any suspicion of malignancy, operation is advised, not as a different method, but as an incident in the course of the treatment. In our experience this occurs in about one case in five of gastric ulcer, the other four do well under medical treatment and, as far as can be ascertained, most of them go on well if a reasonable life is followed. In

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the last 30 cases of gastric ulcer four were advised operation. One died as a result of the operation, one refused operation and died later from a perforation, and the other two benefited from the operation.

Pernicious Anæmia : Preliminary note on the after-results of treatment with liver.

By J. F. WILKINSON, M.B., M.SC., Ph.D., F.I.C., and W. BROCKBANK, M.A., M.D. (Cantab.), M.R.C.P.

(*The Brit. Med. Journ.*, July 6th, 1929, p. 12.)

We have been investigating the after-results of all cases of pernicious anæmia admitted to the Manchester Royal Infirmary during and since 1925, and are publishing our preliminary observations in the hope that they will be of interest to other workers investigating this disease.

The cases fall naturally into two sections: (*a*) Those that received the usual treatment of arsenic and hydrochloric acid before the introduction of the Murphy-Minot diet. (*b*) Those that received the liver treatment, often in addition to the drugs mentioned. The total number of cases studied has been 80, of which 47 belong to the first group and 33 to the second. Briefly our observations are as follows:

(1) Of the 33 patients who left the hospital on the liver diet about 50 per cent. are very well and 15 per cent. in good health except for the symptoms of subacute combined degeneration of the cord, at an average interval of twelve months from their discharge. Only two (6 per cent.) are dead; one did not take the diet after discharge, the other took it regularly until he died (aged 66) fifteen months later.

(2) Of the 47 patients who were not prescribed the liver diet 50 per cent. are dead, at an average interval of ten months from discharge. The remainder, almost without exception, are now on the diet. Their progress is being watched.

(3) The patients who have done best are those who have taken the liver raw or half-raw. Those who have eaten it well cooked have not done so well.

(4) A history of tingling and numbness of the fingers and toes, presumably the earliest symptoms of involvement of the cord, was given by 44 per cent. of all our patients. Of those that are still alive and on liver treatment 52 per cent. have no such symptoms now; 11 per cent. are better, and the remainder (almost all of whom had alterations from the normal reflexes) are no better or are definitely worse. This suggests that liver treatment has no effect on the symptoms of subacute combined degeneration of the cord, once the reflexes show that there is organic disease in the central nervous system. The symptoms gradually become worse, although the patient's bodily health is much better.

(5) Relapses do occur even when the patients are taking liver regularly, but they are not nearly so common (only six cases noted in our series) as they were before liver treatment was tried. Five of these cases were taking the liver well cooked, the sixth was taking it raw, but the relapse followed an attack of influenza.

(6) Of the 47 cases of pernicious anæmia sent out without liver, only 2 had ever worked regularly before the advent of the liver diet; whilst of the 33 cases sent out on the diet 14 are back on full work and 5 are doing part-time work—a total of 57 per cent. at work.

(7) During their periods as in-patients (an average of forty-five days in each case) the following alterations in the constituents of the blood were noted:

	Erythrocytes.	Leucocytes.	Hæmoglobin.
Patients not on liver.	+46%	—8%	+49%
Patients on liver	+94%	+41%	+77%

Of the patients who have done well, almost all have retained some degree of anisocytosis and poikilocytosis; all have abundant platelets, and in all the staining of the erythrocytes is normal.

(8) Diarrhœa and gastric disturbances appear to have been cured by the liver treatment, only one case of recurrent diarrhœa having been noted in a patient who is otherwise quite well. There are no indications that treatment by hydrochloric acid has any appreciable influence—most patients discontinuing its use after discharge. Inadequate liver diet, however, frequently causes a return of gastric discomfort.

(9) Reinvestigation of the condition of the stomach by fractional test meals shows the following results:—

(*a*) Achlorhydria persists in nearly every case. Only two exceptions have been noted, and these will be discussed in a later paper.

(*b*) The total acidities of all samples withdrawn are greatly diminished, being equivalent to 1.5 to 10.9 c.cm. (average 4 c.cm.) of N|10 alkali per 100 c.cm. gastric contents.

(*c*) Total and mineral chlorides, whilst showing parallel titres, give widely varying values in different cases.

(*d*) Peptic activity is very considerably diminished or negligible.

(*e*) The fasting contents in over 80 per cent. of the cases are less than 38 c.cm., the remainder falling between 50 and 80 c.cm.

(*f*) In practically all cases mucus is present in very marked amount in the fasting contents and frequently in the earlier samples of the test meals.

(*g*) Lactic acid is invariably absent.

(*h*) The stomach empties on an average in one to one and a quarter hours.

(10) Several sequelæ of the diet have been described in the literature. Our observations on them are as follows:

(*a*) Persisting eosinophilia (5 to 14.75 per cent.) occurs in patients taking the liver diet.

(*b*) Albuminuria has never been found.

(*c*) One case of venous (femoral) thrombosis has been observed.

Treatment of Pruritus Ani and Anal Fissure; the use of Anæsthetic Solutions in oil.

By W. B. GABRIEL, M.S.

(*The Brit. Med. Journ.*, June 15th, 1929, p. 1070.)

From a practical point of view cases of pruritus ani may be divided into two main groups:—

(1) The group in which some definite local cause is present. This is usually some lesion which causes an abnormal amount of perianal moisture; amongst the commoner of these may be mentioned prolapsing piles, external piles, fissure, fistula, hypertrophied papillæ, rectal polypi and tumours, threadworms, proctitis, etc. Treatment of cases in this group, is limited to removing the exciting cause, together with treatment of the perianal region with simple lotions and powders, is usually effective.

(2) The second group is that in which patients complain of persistent severe itching, but examination reveals none of the obvious causes enumerated above. The rectum is smooth, and examination, as a rule, is negative, except that some evidence is found to confirm the patient's complaint of irritation. The perianal skin is often somewhat thickened and thrown into rugæ radiating from the anus, with a varying amount of excoriation of the skin or fissuring.

It is cases in this second group which are the great problem as regards treatment. It is probable that a chronic neuritis of the sensory nerves in the anal region is present in most cases of long duration, and hitherto the recognized treatment of cases which have failed to respond to local treatment of the dermatitis has been either (1) operation—Ball's operation or any of the various modifications designed towards sectioning the cutaneous nerves of the anus; (2) the subcutaneous injection of various solutions such as absolute alcohol, quinine-urea, hydrochloric acid, etc.; (3) *x*-radiation.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

After working for the last eight years in the out-patient department of St. Mark's Hospital, I have been impressed with the unsatisfactory results generally obtained by these methods. Judging from the number of patients who attend who have previously had one or more courses of *x*-ray treatment, the conclusion is forced upon one that the relief obtained, if any, is often of short duration, and the necessity for repeated courses of *x*-rays is dangerous. *X*-ray dermatitis and *x*-ray carcinoma of the anus are well-known catastrophes. As regards Ball's operation, it is true that, if properly done, patchy anæsthesia results at once in the flaps outlined by the operation, but it seldom lasts more than a few months; the extensive wound never heals by primary union, and although there may be relief for a time, the irritation often returns after a few months. There is then quite often the added trouble that an atrophic condition of the skin flaps is liable to develop; the perianal skin within the two curved incisions appears thin, shiny, and discoloured, often with patchy excoriation; this may be partly a trophic condition from section of the sensory nerves, and partly due to the impaired vascular supply; it is, I think, a serious objection to Ball's operation.

Pruritus being essentially a local condition, it is reasonable to expect a local treatment to relieve it, and subcutaneous injection of an anæsthetic solution appeals to me as being a sensible method likely to succeed. I was therefore greatly attracted by the report of Drs. Yeomans, Gorsch and Mathesheimer on the use of benacol in the treatment of pruritus ani. This solution was introduced to me last autumn by Dr. Frankfeldt of New York, who very kindly provided me with a supply for trial at St. Mark's. To quote Dr. Yeomans: "Benacol is a solution of equal parts of para-amino-benzoyl-benzoate and phenmethylol in 90 parts of rectified sweet almond oil. It is non-toxic, highly anæsthetic, moderately antiseptic, and, as far as investigated, has a mild depressant action on peripheral nerve endings."

The use of an oily as opposed to an aqueous solution would appear to be particularly valuable as a method of delaying absorption of the local anæsthetic, and therefore of extending the duration of its action. As an alternative solution to benacol, I have tried and found equally satisfactory a solution known as "A.B.A.," prepared for me by Messrs. Allen and Hanburys, which is now available. "A.B.A." is a 3 per cent. solution of anæsthesin with benzyl alcohol 5 per cent. and ether 10 per cent. in sterilized olive oil.

Method of Injection.

The contents of an ampoule of benacol or "A.B.A.," previously warmed by immersion in hot water, in order to render it more fluid, are drawn into a 2-c.cm. Record syringe. A fine hypodermic needle is attached, and the solution is injected subcutaneously in a fan-shaped manner around and up to the anal margin. The first injection is usually made under the area of maximum irritation. Two ampoules (4 c.cm.) can safely be injected at a time. The injections are usually repeated at intervals of three to seven days until the entire perianal region has been injected, when areas of continued irritation can then be reinjected.

Results.

A slight burning pain has been complained of by some patients either during the injection or some hours later. There has been no general reaction and no complication (particularly inflammation or sloughing of skin) has occurred. No medicinal treatment (bromides, etc.) has been given to any of these patients, and only the simplest applications have been made to the local dermatitis. Sixteen cases have been treated since September, 1928—7 females, 9 males. The irritation in 10 may be classified as severe, in 6 as moderate. The number of sessions has varied from one to six, and the greatest amount of benacol or "A.B.A." that any one case has yet received is 22 c.cm., the average being 8 c.cm. It is too soon as yet to speak of "cure," but all of these patients have been relieved, and 8 have been so much improved that they are now practically free from all symptoms. In at least 4 cases with severe dermatitis the visible improvement in the perianal skin has been most dramatic.

Anal Fissure.

Spasm of the external sphincter ani is undoubtedly the cause of the chronicity of anal fissures, and hitherto the various methods of treatment advocated have in reality been directed—and rightly so—towards relieving sphincteric spasm. These methods may be classified into: (*a*) those which promote relief of pain and consequently the spasm; (*b*) those which attack the spasm first.

Under the first heading are the following favourite methods: (1) insertion of analgesic ointments such as those containing cocaine, anæsthesin, chloretone, opium, and belladonna; (2) local application to the surface of the fissure of an albumin-coagulating agent such as silver nitrate, mercury perchloride, nitric acid, or ichthyol; (3) injection under the base of the fissure of an anæsthetic solution such as quinine-urea. The second method of treatment includes the old operation of forcible stretching of the sphincter muscle under local or general anæsthesia, and the various degrees of "incision" ranging from partial to complete division of the sphincter.

All of these methods have been useful, but the chief drawback has been their unreliability. The palliative methods have often failed to relieve the sphincteric spasm, and I have several times seen a recent fissure—in spite of treatment—gradually become chronic and undermined, until finally operation has had to be undertaken. The operation of divulsion of the sphincter is often successful, but, on the other hand, I have known cases where the fissure has failed to heal, with return of sphincteric spasm within a few days after the operation. The operation of incision of a fissure is a very excellent one when applied to the chronic undermined fissure, and is usually the only certain method of getting these cases to heal, but no one will deny that the after-treatment is a painful one; the wound takes three to five weeks to heal, and it is a severe operation to undertake for a recent fissure.

In the last eight months I have been using benacol and "A.B.A." for the treatment of anal fissures, and as an ambulatory method this promises to cure rapidly a very large percentage of cases. It is, in effect, a combination of the two methods outlined above, and consists in the injection of these solutions into the external sphincter muscle and under the base of the fissure.

Method.

For treatment of the usual dorsal fissure the patient lies on his right side and the anus is painted with tincture of iodine. A 2-c.cm. Record syringe is filled with "A.B.A." and with a hypodermic needle the skin is punctured one inch behind the anus in the middle line. The left forefinger is passed into the rectum as a guide and the needle is thrust deeply into the sphincter, first on one side of the middle line and then on the other, about three-fourths of a cubic centimetre of "A.B.A." being injected into each side. The needle is then partially withdrawn and is directed forwards in the middle line under the base of the fissure where the remainder of the solution is slowly injected. This completes the first treatment, but if desired an application of pure ichthyol to the surface of the fissure may be made. In one case in this series I injected an anterior fissure in a similar manner with success.

A varying amount of pain is complained of during the actual injection, but it is seldom severe. Some cases have had pain three or four hours after the injection, but only in a few very nervous subjects has this late pain been at all marked. In every case of fissure injected great relief has been noted, or even complete absence of pain within the first twenty-four or forty-eight hours after the injection.

When re-examined, between the third and seventh days after injection, the local result is invariably very striking. Sphincteric spasm has usually completely disappeared; the finger is admitted readily without pain and the margins of the anus can be separated in a normal manner. In a number of cases at this stage a sentinel

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The success following the administration of certain derivatives of

CHAULMOOGRA OIL

AND

HYDNOCARPUS OIL

in the treatment of

LEPROSY

has been proved by experience in practice, and their value in mitigating the effects of this distressing disease is unquestioned.

CHAULMOOGRATES and HYDNOCARPATES are made in the Chemical Works of the British Drug Houses Limited specially for medical use in the treatment of Leprosy.

They are of the highest possible degree of purity and therapeutic activity, and, being perfectly stable, they can always be relied upon to be constant in action.

They are issued as follows:—

ETHYL CHAULMOOGRATE, B.D.H.
In ampoules containing 1 c.c. up to 6 c.c.

ETHYL HYDNOCARPATE, B.D.H.
In stoppered bottles containing 50 c.c. or 100 c.c.

SODIUM CHAULMOOGRATE, B.D.H.
In powder form, in ½ oz. and 1 oz. bottles.

SODIUM HYDNOCARPATE, B.D.H.
Tablets of 1 grain, 2 grain and 3 grain; ampoules of 1 grain, 2 grain, and 3 grain in 1 c.c.

Details of prices of these and of all other B.D.H. medical products can be obtained from the B.D.H. resident representatives in India:—

HENRY S. CLARK,
8-10 Waterloo Street,
CALCUTTA.

BYRAM MISTRY,
Graham's Buildings,
Parsee Bazar Street, Fort,
BOMBAY.

THE BRITISH DRUG HOUSES LIMITED
LONDON

Ch/In/289

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"TRADE MARK NORMACOL" BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

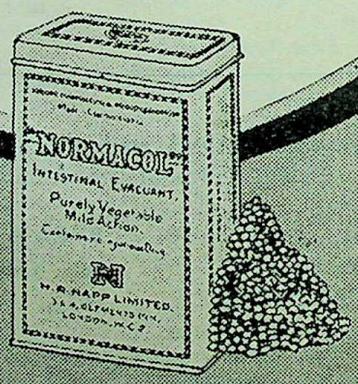
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H. R. NAPP LIMITED.

3 & 4, Clements Inn, London, W.C.2.

Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Five Lines).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

pile, if present, has been excised with scissors without further anæsthesia and without more than a faint sensation being noticed by the patient. Pure ichthyol is applied at this stage to the surface of the healing fissure, and the usual course of events now is for the fissure to be found completely healed about two or three weeks after the first injection, with the patient quite free from any symptoms. I do not consider the presence of a small sentinel pile at the outer end of the fissure to be a contra-indication to the use of this method. The sentinel "pile" is usually a small œdematous tag which on several occasions I have observed to disappear when sphincteric relaxation has been obtained by injection of "A.B.A." In other cases the tag has subsequently been excised, either without further anæsthesia or after injection of a few drops of novocain. I believe this method will sometimes prove of value, even in the case of an undermined fissure; if the sphincter has been made to relax I see no reason why an undermined tag should not be removed locally and successful healing obtained. In a few cases I have given a second injection of "A.B.A.," but as a rule the relaxation lasts sufficiently long for the fissure to heal, and the spasm then does not return. In one case, injection of "A.B.A." was of particular value in that it allowed adequate examination of the rectum (at first impossible on account of pain) to be performed a week later, when a large fibrous polypus in relation to the upper end of the fissure was discovered and accordingly removed. In no case has there been any history of incontinence from lack of sphincteric tone.

To summarize the results; 30 cases from my out-patients' clinic at St. Mark's Hospital and from my private practice have been injected; 18 have been discharged healed, mostly within a period of ten days to three weeks after the injection of "A.B.A."; 6 cases remain under treatment. Two cases with indurated fissures were injected with "A.B.A.," but on further consideration I decided that operation would be more suitable and certain. Finally, 4 cases of recent fissures were injected once, but have not reported for re-examination. So far as I am aware, no patient has had to lie up or discontinue work while under treatment.

Conclusions.

As an ambulatory treatment for pruritus ani the subcutaneous injection of anæsthetic solutions in oil, such as benacol and "A.B.A.," would appear to be safe, of considerable value, and worthy of extended trial.

In the treatment of recent anal fissures the method described can be promised to effect a rapid and brilliant cure, and this early stage is obviously the best for treatment to be undertaken. In fissures of some duration, relief of pain and healing are likely to be obtained in a considerable proportion of cases.

The Treatment of Pernicious Anæmia by Liver.

By C. H. MELLAND, M.D. (Lond.), F.R.C.P.

(*The Brit. Med. Journ.*, July 6th, 1929, p. 9.)

THE liver treatment of pernicious anæmia was introduced by Minot and Murphy in America, and their first series of cases was published about three years ago. Several of my patients started this treatment as early as July 1927.

Since then I have had about forty cases under my care on this mode of treatment, and one can now draw some general conclusions as to its value, particularly its value as compared with methods of treatment previously employed.

It may be said in general that with the exception of four patients who were very ill when first seen, and who died within a few days, and the same number whom it has been impossible to trace or who failed to persevere with the treatment, all are alive and reasonably well to-day—the majority very well and following their regular work. One has died from intercurrent disease. In most cases the period of treatment has been little more than a year and a half, and a good deal less than this in many, and I find, on going through my records, almost as satisfactory results in a good many cases from our older methods of treatment. For a fair estimate of its value, therefore, it must be compared with some of the results in these older cases.

Summary.

From my study of these cases there are certain general conclusions at which I have arrived.

(1) On our older lines of treatment, if efficiently carried out, many, if not most, cases of pernicious anæmia may be given many years of useful life; but there are practical difficulties in getting the treatment effectively applied, which consequently result in a large proportion of failures.

(2) The introduction of the liver treatment has undoubtedly greatly increased our power of dealing with the disease; the improvement is more rapid and the advance in the number of red corpuscles is higher.

(3) Continued treatment by liver will maintain the improvement, and it will do this more easily and with less meticulous attention to details than will our older methods alone. Consequently, though not necessarily more successful—as I have already demonstrated—it is undoubtedly, more simple to carry out, and so there is much less risk of failure.

(4) At the same time whilst relieving the symptoms it does not appear to strike at the root of the disease, so as to produce a complete and lasting cure. So far as we can say at present, treatment must be continued, and, if given up, or insufficiently followed out, relapse will occur.

(5) Though 6 or 8 ounces of minced liver ("potted liver") in the day is usually advocated, I have found in general that when combined with the older methods of treatment 4 ounces or even 3 ounces may be quite effective. This is of importance in the case of those who dislike the liver and take it only with reluctance.

(6) When the red corpuscles have been raised to 4,000,000 or over a smaller amount of liver—3 or 4 ounces every other day, or even as little as 1|2 lb. in the week—will maintain the improvement, at any rate, if combined with some continued or occasional courses of treatment, in moderate degree, of the older methods of treatment.

(7) It is important not to push the dose of liver too high or to keep on with the use of full doses too continuously. There is some reason to suppose that over-use may risk the production of gout or chronic nephritis. As in all other methods of treatment, its use must be guided by the consideration of the condition of the blood.

(8) In those who have insuperable difficulty in taking the fresh liver, liver extracts, either solid or liquid, may be used. They appear to be equally effective with the fresh, but are very expensive.

(9) Although it has been supposed that the liver treatment leaves the nervous symptoms untouched, I am not sure that this is the case. In three cases in which these symptoms were prominent and in which arsenic had appeared, whilst curing the anæmia, to aggravate the nervous symptoms, slow improvement has occurred with the use of liver and dilute hydrochloric acid. In many cases the slighter nervous symptoms, the numbness and tingling about the fingers and toes, have been materially improved.

(10) Lastly, accurate diagnosis of the disease is of greater importance than ever it was.

Difficult Labour.

By R. W. JOHNSTONE, C.B.E., M.A., M.D., F.R.C.S. (Edin.).

(*The Brit. Med. Journ.*, June 22nd, 1929, p. 1105.)

EVERYONE with obstetrical experience will agree that the commonest cause of difficulty in labour is the occipito-posterior position of the vertex. Probably the second most frequent cause is breech presentation.

Occipito-Posterior Presentations.

Considering how small is the deviation from the normal, the amount of trouble and worry which

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

occipito-posterior positions cause is astonishing. Difficulty, of course, arises mostly in those cases in which the occiput fails to rotate spontaneously to the front, and this is due mainly to a lack of complete flexion of the head. It is elementary knowledge that an imperfectly flexed head throws larger diameters across the pelvis than a completely flexed one, and in the case of occipito-posterior positions this results in, first, late engagement of the head at the brim of the pelvis; secondly, a tendency to arrest and impaction of the head when it is in the cavity; and thirdly, great difficulty in the birth of the head, face to pubes.

The late engagement or arrest of the head at the brim, which occurs in some occipito-posterior cases, is largely due to the wide posterior part of the head trying to get into the pelvis through the sacro-cotyloid diameter, which is rather small for it. An important corollary is that this arrest of the posterior part of the head tends to a still further undoing of flexion and a consequent increase in the antero-posterior measurements of the head thrown across the pelvis. The degree of misfit which is thus present between the presenting part and the brim of the pelvis may lead to the membranes protruding through the partially opened os in a sausage shape; and, as always, such membranes are peculiarly liable to early rupture. Cases, therefore, in which there is considerable arrest of the head at the brim of the pelvis are often further complicated by the labour becoming a dry one. The result in such cases is a prolonged and painful first stage, dragging on hour after hour and it may be day after day, with intervals during which the pains, in some cases never properly efficient or regular owing to the lack of proper pressure by the head and the bag of membranes upon the region of the internal os, tend to cease altogether.

In time, however, the cervix becomes completely dilated and the moulded head slowly passes down through the pelvis, delay being experienced throughout, owing to the large diameters of the head. The crucial point is when the head reaches the pelvic floor. Where the flexion has been complete and the first stage more or less normal, the occiput rotates to the front without any great difficulty, but in the cases which we are considering, where flexion is imperfect, there is often great delay in the occurrence of rotation. In many cases the head remains in the oblique diameter of the pelvis simply because the uterus has become too exhausted to cause rotation; in other cases the deflexed head becomes impacted upon the ischial spines, while in still others, in which the degree of deflexion is even more marked, the sinciput becomes the leading part of the head, and is rotated to the front, while the occiput slips into the hollow of the sacrum. Delivery with the head in this position involves the passage through the outlet of the pelvis of diameters which are probably from a half to three-quarters of an inch longer than in a normal labour, with the consequence that great force must be exercised either by the uterus or by the forceps, and that a deep tear of the perineum is almost inevitable. All of us have experienced cases illustrating difficulty at any or all of the stages I have mentioned, but it may be helpful to consider them calmly in an atmosphere more judicial than the lying-in chamber.

Diagnosis.

Before making any remarks with regard to treatment I must refer to diagnosis, because every year's increasing experience has brought it home to me that failure to recognize the occipito-posterior position is a more fruitful source of worry and suffering and disappointment than almost any other diagnostic error in midwifery practice.

Ante-natal examination will, in most cases, reveal the occipito-posterior position. The method of examination is abdominal and depends in the main upon failure to recognize the continuous resistance of the back running down the front of the uterus on one or other side of the middle line. Secondly, the small parts of the fœtus are palpable with ease on both sides of the middle line. Thirdly, the trunk of the child may be felt well round to one or other flank, usually the right. Fourthly, the fœtal heart is best heard well round to the flank, but may sometimes be heard also anteriorly on the opposite side of the abdomen. This last is a point of importance, as it indicates that the child is lying with its spine straightened and its chest thrown forwards, and this implies a degree of undoing of the flexion of the head.

Owing to the difficulty which the head, especially if incompletely flexed, may have in entering the brim of the pelvis, it tends to remain movable above the brim, even in a primigravida, until the commencement of labour. Failure of the head to engage in the brim of the pelvis at least a fortnight before labour in a primigravid woman should always make one think hard, and lead, if necessary, to revision of the pelvic measurements; but if these are quite satisfactory, then the posterior position of the head is enough to account for the failure to engage. Up to about five or six weeks before full time the child may quite readily change its position spontaneously, and come to lie occipito-anterior; but it rarely changes within the last fortnight, indeed comparatively seldom within the last month, and I think that cases of occipito-posterior position diagnosed in the later weeks should be treated by an effort to correct the position.

The only method that I know which affords any prospect of success is the one described by Dr. R. C. Buist of Dundee. The patient is asked to come back, bringing with her two pillow-slips and a bolster-slip. One pillow-slip is folded into a firm cylindrical pad or roller, which is then placed on the right flank (I am assuming a right occipito-posterior position in this case), in order to press the anterior shoulder of the child towards the middle line. The other pillow-slip is folded in four and placed as a firm pad on the left side of the lower abdomen to press back the limbs of the child, while the bolster-slip is fixed as a firm abdominal binder to keep the pads in position. The patient is then told to go home, to rest as much as possible during the next forty-eight hours, and to take a dose of castor-oil the morning after the pads have been applied. In a series of close upon a hundred cases, regarding which careful notes were taken in our ante-natal department, Haultain found that the occiput rotated to the front in rather over 80 per cent. Once it has come round to the front the head tends to engage, especially if a firm binder be kept in position to press it into the pelvis, and relapse cannot occur. After the head has begun to engage with the occiput posterior, any attempt to rotate it by means of pads is, of course, useless, and the first stage of labour must be allowed to complete itself before any question of intervention arises.

During labour the diagnosis can again be made by the abdominal method, but an aseptic vaginal examination will further confirm it. The main point here is the recognition of the anterior fontanelle lying to the front, and it is important to try to feel also the posterior fontanelle, usually pretty high up in one or other posterior quadrant of the pelvis, and to attempt to assess the relative levels of the two fontanelles. This gives one an idea of the degree of flexion of the head. If, at the end of the first stage, there is still any doubt as to the exact position of the head, the point can be settled beyond all question by feeling the ear of the child. The one or two fingers which are sufficient to make the vaginal examination in a normal case are quite inadequate in an abnormal case. The secret of correct diagnosis in all cases of difficult labour is "chloroform and the whole hand." Under anæsthesia, and with aseptic precautions, the hand is slipped up the side of the head until the ear is felt, and when it is flattened out on the head, the pinna points towards the occiput. The importance of this method of diagnosis is very great, because, as I have already indicated, so many disasters result from allowing the case to drift on without the attendant having an accurate knowledge of the position of the head, and therefore of the real cause of the delay.

Difficulties are likely to be encountered only where the head is imperfectly flexed; if, therefore, we can at a comparatively early stage recognize that we are dealing not merely with an occipito-posterior presentation, but

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

DIET IN INDIA

The following striking tribute to the Therapeutic Value of Dimol will appeal to all Medical Practitioners in the East.

"On arrival in this country one commits indiscretions in the way of fruit-eating, cold bathing, etc.

"In a very short time, and for a whole year, I was troubled with recurrent non-amœbic dysenteries lasting about a fortnight at each attack, in spite of diet, bismuth, pulv. cret. arom. c opio, acid sulph. and kaolin. The short intervals between attacks were also periods of dieting... and I had to adopt cholera belts even in hot weather. Cold bathing was taboo.

"I should like to say how grateful I am personally to Dimol; I certainly would not be without it now. It can be relied upon to abort an attack and to limit the period of diet to one or two days. I can now eat forbidden fruits (melons, etc.) *ad. lib.*, discard cholera belts, and enjoy an hour's swimming daily.

"This is my third hot weather, and I have had only one month on the hills."

————, M.B., Ch.B. (Ed.).

After long and thorough investigation, Dimol pulverettes are now supplied by the Admiralty for use in His Majesty's Ships and Royal Naval Hospitals.

DIMOL LABORATORIES, LTD.,

40, Ludgate Hill, London, E.C. 4.

Dimol may now be obtained from all Wholesale and Retail Distributors throughout India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

***Vide* Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.**

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

with an imperfectly flexed head, then we are in a position to consider whether or not early intervention is advisable. Signs which point significantly to imperfect flexion are, first, delay in the engagement of the head; secondly, sausage-shaped membranes; thirdly, rupture of the membranes early in the first stage; fourthly, ability to hear the fœtal heart through the chest of the child; and fifthly, the anterior fontanelle lying on a lower level than the posterior, as felt by vaginal examination.

The moral to be drawn from experience is that if we can definitely recognize a lack of complete flexion from the presence of two or more indications we may justifiably and advantageously intervene early, in the interests of both mother and child; experience tends to show that when intervention has to be undertaken late in labour both patients are more exhausted, and the actual intervention itself is more difficult.

Management.

I am no advocate of unnecessary intervention in labour, very much the contrary, indeed. In the great majority of occipito-posterior cases the occiput will rotate to the front, if given sufficient time; it is only where one has definite evidence that in a given case the head is so deflexed that it will probably not rotate spontaneously to the front that I think one should intervene early. Such cases will probably form only from 10 to 20 per cent. of all occipito-posterior presentations. The method of intervention indicated is manual rotation, and with the head at the brim this is an easy operation. It is important to visualize exactly what we propose to do before the hand is introduced, just as in a case of internal version. Without this precaution, we may find ourselves attempting the operation in a strained attitude or with the hand which is obviously less convenient than the other hand would have been. It is important to try also to rotate the body of the child by external manipulation, and this can be helped in many cases by grasping the anterior shoulder between the tips of the first and second fingers *in utero*, while the palm of the hand is spread over the side of the child's head, and actually produces rotation of the head. Some authors have, I think, exaggerated the risk of rotating the child's head without the rotation of the shoulders. The child's neck is capable of rotation without injury to an extent considerably beyond the capacity of the adult, and I have again and again rotated the head without succeeding in rotating the body, and the child has been in no way affected. At the same time, it is certainly desirable to make every effort to rotate the shoulders, and there is a greater likelihood of the head going back to its original position if the shoulders are not turned.

When we come to the question of the arrest of the head on the floor of the pelvis we have to decide whether to attempt to rotate or to deliver by forceps as a face to pubes case. I confess that I very much prefer rotation to forcible delivery face to pubes; indeed, I think that to deliver a child of normal size as a face to pubes case should be regarded either as a failure in diagnosis or as a confession of failure in efforts to rotate. It is the most undesirable method of all, because it inevitably necessitates undue force and laceration. With regard to the methods of rotation, manual rotation is much safer than forceps rotation. Rotation of the head in the cavity is not, as a rule, a difficult matter. All that is required is that the head should be gently pressed back a little so as to undo any actual impaction; flexed, if possible, so as to throw smaller diameters across the pelvis; and then, if the side of the hand is spread out over the side of the head, a mere movement of rotation of the hand will produce a corresponding rotation of the head. As before, a similar effort should be made to rotate the shoulders by external manipulation through the abdominal wall. Lastly, in this connection, we must not forget that, although the position is unquestionably the rarest of all, yet the left occipito-posterior position does exist. Therefore, if difficulty is found in trying to rotate the occiput round the right side of the pelvis, an effort should be made to rotate it round the left side before giving up manual rotation as impracticable. Should manual rotation fail, then forceps rotation, provided great care is used to avoid injury to the maternal soft passages as well as to the child's head, is a useful method of treatment. One of the secrets of success is to sweep the handle of the forceps gently and slowly round the arc of a considerable circle, so as to reduce to a minimum the movement of the blades inside the pelvis.

Where rotation has been effected by hand, the head should be well pressed down on to the floor of the pelvis by fundal pressure, and the remainder of the labour either left to nature or shortened by forceps, as circumstances indicate. When the head has been rotated by forceps, then I think that the rest of the delivery should also be conducted instrumentally by the rapid reapplication of the instruments with the blades in their proper position.

In cases where the delivery, for one reason or another, is being conducted face to pubes, and where considerable tearing is likely, I strongly advocate the deliberate incision of the perineum—that is to say, an operation of episiotomy. Personally I prefer to make this incision in a postero-lateral direction, so that any extension of the incision will avoid involvement of the anal sphincter. The subsequent stitching of a clean cut like this is very much easier, and the anatomical restoration of the parts simpler than in an irregular laceration, while the additional room which it gives shortens very materially the latter part of the delivery.

Breech Presentations.

The next most common cause of difficult labour is, I think, breech delivery, and an analysis of the complications and difficulties which we have met in recent hospital experience of 233 breech deliveries in three years clearly indicates that the main causes of trouble are the impaction of the breech, especially in cases of frank breech, and, secondly, arrest of the after-coming head, due either to imperfectly dilated passages or to some undoing of the flexion of the head by pulling on the limbs. In these 233 cases we had 8 maternal deaths, but in only one could death be attributed even indirectly to the nature of the labour—a death from septicæmia following impaction at the brim. All the other 7 cases were very seriously complicated by eclampsia (2), concealed accidental hæmorrhage (2), acute rheumatic fever, acute pulmonary œdema, and grave cardiac disease with heart failure. The fœtal mortality (78) in these 233 cases varied from 3 per cent. in one year to 18 per cent. in another, after complications such as placenta prævia, contracted pelvis, accidental hæmorrhage, extreme prematurity, etc., had been deducted.

I am not able to explain the great difference in different years. It may just be a matter of good or bad fortune, but it is quite possible that it is an indication of the skill of the house-surgeon at the time, because it is a well-known fact that the fœtal mortality in breech cases depends in considerable measure upon the knowledge, skill, and presence of mind of the obstetrician.

The greatly increased difficulty and danger, especially to the child, in a breech case in the primigravida is so well recognized that we invariably make an effort to correct this malpresentation where it is met with in such patients in the ante-natal department. During the three years in which we dealt with these 233 cases there were to our knowledge an additional 44 cases so averted by external version.

Management of Breech Labour.

With regard to the general management of breech labour I have nothing to say that is in any sense new, but some points in the old and sound teaching may bear repetition. Masterly inactivity in the early stages is unquestionably the keynote of success. My old master, Sir Halliday Croom, used to sum it up in the words, "Hands off the breech," and this certainly may be said to summarize the whole management of a normal breech case up to the birth of the lower limbs. Frank breech cases always tend to give more trouble than those in which the attitude of the child is one of complete flexion. The extended legs act as splints to the trunk and prevent the lateral flexion of the trunk, which is an essential feature in the descent of the breech through the pelvic

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

outlet. Impaction of the breech is therefore very liable to occur when it reaches the pelvic floor, and artificial assistance is often needed. This usually takes the form of bringing down one or sometimes both legs, and the fact that this diminishes the bulk of the breech as it passes through the outlet of the vagina, and that the soft passages are therefore not so completely dilated as they would otherwise have been, leads not infrequently to subsequent difficulty in the birth of the head.

In the 233 breech cases we had 21 cases of frank breech. Artificial assistance of one sort or another was required in 20 of these—that is, in over 95 per cent. The assistance took the form, in most instances, of extraction of the breech after bringing down a leg, and in 7 of these cases an episiotomy was performed in order to give more room for manipulation. No maternal deaths occurred, but 7 still-births—that is to say, a fœtal mortality of 33 per cent. in this particular set of cases. The cause of death was cerebral hæmorrhage in 4 instances, and asphyxia in 2, while one child was dead *in utero* on admission of the mother to hospital.

Treatment of Impaction.

This leads me to speak briefly of the treatment of impaction. If it occurs at the brim, the cause is almost always either the mere bulk of the breech or a contracted pelvis; if it occurs when the breech has reached the pelvic floor, the cause is usually a frank breech. With the breech at the brim, the treatment is to push the breech gently out of the pelvis and to bring down one foot, the foot lying anteriorly by preference. Unless there are definite indications for the rapid completion of the labour it is much safer for both patients to leave Nature to drive the half-breech slowly through the pelvis rather than to proceed immediately to the extraction of the child. To overcome the impaction is usually all that is needed, and intervention at this stage should preferably stop there.

When the impaction occurs at the pelvic floor—due usually to a frank breech—an attempt may be made to hook down the breech by passing the finger into the groin. The breech hook should be used only if the child is dead. No great degree of force can be exercised by the finger or fingers in the groin, and, if we fail, we may sometimes succeed in extraction by the use of forceps; but the grip is not a very satisfactory one, and I do not regard the breech as at all a good indication for the use of forceps. I believe that better results follow if, with the patient in the Sims' position, the breech is gently pressed back to the brim and one foot is brought down as before. The risk of doing this is undue stretching of the lower uterine segment, but if the patient is deeply anæsthetized, and if the manipulation is gently and slowly done, the risk is not great.

When intervention is required for the extraction of the after-coming head or for the bringing down of a displaced arm, the great danger is that the obstetrician may become flurried. It is perfectly true that there is no time to lose, but it is equally true that "the more hurry, the less speed." To be successful the intervention must be carried through exactly according to the book. I say this because, to the man who is anxious and flurried, and who dreads that he is going to have a still-birth, the temptation to pull, in the hope that with a little extra force he will be able to extract the head, although it may be partially extended, or although one arm or even two may be displaced alongside it, is almost irresistible. The sooner that man realizes that in such an effort he is wasting valuable time and endangering the child's life, and that there is no road to success except the high road, the better for his obstetric practice. Two other small points in this connection are: first, that no attempt to bring down an arm should be made until the trunk is born as far as the scapula—in other words, the arm must be brought well into the cavity of the pelvis and within reach, otherwise the attempt to get it down will fail; secondly, that in a case where intervention is hindered by a tense perineum, and in all cases of a primigravid breech labour, an episiotomy ought to be made, because the additional room which it gives is an enormous advantage in the necessary manipulations, and in the subsequent birth of the head.

Lastly, the Prague seizure is generally to be condemned as a crude and somewhat brutal method of extraction, in which one has little control over the force exerted. It is not comparable in efficacy with the Mauriceau-Smellie grip with the child astride the forearm and two fingers placed well back over its tongue. The essence of the manœuvre is to produce flexion of the head simultaneously with the extraction, and this can unquestionably be best brought about by the fingers on the tongue pulling down the face, while the occiput is forcibly lifted up against the symphysis pubis in the movement of extraction.

The After-coming Head.

The application of forceps to the after-coming head is a method of treatment which is more ignored than it deserves to be. If the forceps are sterilized and ready, it does not take more than a few moments to apply them to the after-coming head with the trunk and limbs of the child swung well forward and out of the way by an assistant; and there is no question that the forceps give a degree of control over the movements of the head which is greater than that obtained even in the Mauriceau-Smellie manœuvre, while the application of the force to the head and not to the neck is probably safer for the child. I always like to have forceps ready in a breech delivery, and I have found them a most satisfactory means of delivering the after-coming head. Herman described it, without qualification, as "the best treatment where help is needed in the delivery of the after-coming head."

From the figures I have already quoted with regard to still-births in frank breech cases, it will be seen that cerebral hæmorrhage is one of the commonest causes of death. This exceedingly important observation is based on the incontrovertible evidence of a large series of post-mortem examinations. The hæmorrhage is due in most cases to tears in the ligaments of the brain, the falx cerebri, and, in breech cases especially, the tentorium cerebelli, and the injury to these structures is unquestionably due to the fact that in the rapid extraction of the after-coming head the skull is exposed to rapid changes of shape, putting a sudden strain upon its internal structures which they are incapable of sustaining. In a head-first labour the slow moulding of the head allows very considerable changes in the shape of the head to occur without corresponding damage, but this is simply because the moulding forces are applied so slowly. As showing the frequency of these intracranial injuries Holland, in an examination of the bodies of 16 infants delivered by the breech, found such injuries in no fewer than 14, while Heidler, in a recent examination of 99 cases of still-born breech deliveries, found tears of the tentorium in 68; in 11 he found death to be due to asphyxia, while in the remaining 20 cases the skull was not dissected, so that no actual diagnosis was made. Browne, on the basis of an examination of 200 still-births in the Edinburgh Maternity Hospital, showed that cerebral hæmorrhage was ten times more common in breech than in vertex cases.

The moral to be drawn from these observations is that intracranial injuries resulting from the rapid extraction of the after-coming head are a considerably greater source of danger to the child than is asphyxia from delay in the birth of the head. It is generally accepted that the fœtus can exist for at least ten minutes without receiving fresh supplies of oxygen. Bourne, in his valuable little book, Recent Advances in Obstetrics and Gynæcology, refers in this connection to the apnœic condition of children born after a prolonged period of "twilight sleep," and who, if left severely alone but merely kept warm, remain motionless for perhaps ten minutes or a quarter of an hour while the heart beats quite regularly, and then quietly and gradually establish respiratory movements. As one who uses "twilight sleep" to a large extent, I have had a great many instances of this, and I can confirm it absolutely. But the application of the matter at present is that it emphasizes the need for care and deliberation in the extraction of the head, and the danger of "hurry."

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Arthigon

Schering

Anti-gonococcal vaccine polivalent and retaining its efficacy for an unlimited time

Indications

Gonococcal complications, prostatitis, epididymitis, adnexia, arthritis, gonococcal rheumatism.

Arthigon is an emulsion of gonococci in a solution of Urotropin, which latter guarantees its perfect stability even in hot countries. The emulsion is an association of the stimulant specific of the gonococci with the omnicellular specific of Urotropin.

Samples and literature on application to:

SCHERING-KAHLBAUM (INDIA), LTD.

Telephone: Cal. 4770
Telegrams: Aeskulap

CALCUTTA

4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

F. SCHWERZMANN & CO., Rangoon (Burmah): 26, Merchant St.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In 30 years of

ASPIRIN, no one has yet succeeded in preparing a preparation which comes up to the standard of the original

"BAYER'S ASPIRIN."

BAYER

The French Physician Dr. A. Medon reports cases, where heavy sweating, buzzing of the ears, engorgement of the nasal mucous membrane and of respiratory tract, ensued upon taking of the *so-called* "ASPIRIN" (Le Concours Medicinal No. 519 de.).

ASPIRIN

Literature and full particulars on application.

HAVERO TRADING Co., Ltd., CALCUTTA,

Pharmaceutical Dept., Bayer-Meister-Lucius

P. O. Box No. 2122, 15, Clive Street, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

White Asphyxia.

There is far too much done in the way of violent efforts at resuscitation of the asphyxiated child, and there is no question in my own mind that in many cases the child who is in this condition of suspended animation actually has the flickering spark of life extinguished by these misguided efforts. Clearing out the mucus and liquor amnii from the throat by means of a soft rubber suction tube, warmth to the surface of the body, and a little old brandy on the gums and palate, and in severe cases the intramuscular injection of one or two minims of pituitary extract, have in my experience proved most successful. The main general point to remember is, however, that infants who pass into a condition of white asphyxia are suffering from a condition akin to shock, and should be treated along appropriate lines, warmth and extreme gentleness of handling being the essentials.

Reviews.

RECENT ADVANCES IN TROPICAL MEDICINE.—By Sir Leonard Rogers, C.I.E., M.D., F.R.C.S., F.R.S. Pp. 439 with 15 illustrations. London: J. & A. Churchill, 1929. Second Edition. Price, 12s. 6d.

THE first edition of this notable book was reviewed in our issue for April 1928. It says much for Sir Leonard Rogers' facile pen and immense industry that a second edition should have been called for in little more than a year from its first publication. The book is one which every practitioner of medicine in the tropics should read again and again, for nowhere else will he find so vivid, so succinct, and so forcible a presentation of the subject. It is almost an essay-review in the best style of the *Tropical Diseases Bulletin*, expanded into a book; and a brief book at that. Every section is packed with information; whilst the list of references at the end of the chapters will be appreciated especially by those who wish to look up literature on the particular subjects with which they are dealing.

We have already reviewed the first edition; so need not say much about the second, except to say that it is an improvement on the first. The entire work has been most carefully revised. New sections have been added on Oroya fever and verruga peruana, on helminthic infections, granuloma inguinale and climatic bubo; new illustrations have been introduced, whilst some old material has been eliminated. Throughout the book the author keeps the *treatment* of tropical diseases before him as his main theme, and to the medical man working on his own, away from the facilities of a library, this book ought to make a special appeal.

A few misprints and typographical errors are to be noted, and should be corrected in future editions. On p. 31, when dealing with kala-azar in India, "the endemic areas of North-West India" should undoubtedly read "the endemic areas of North-East India."

The style of publication is admirable, and both the author and his publishers are to be congratulated on a work which will make a special appeal to all medical workers in the tropics. There is no other book which can quite take its place.

R. K.

THE ORIGIN OF MALIGNANT TUMOURS.—By Theodor Boveri. Translated by M. Boveri. London: Baillière, Tindall & Cox. 1929. Pp. IX plus 119. Figs. in the text 2. Price, 11s. 6d. net.

THE author's extremely ingenious and careful cytological studies of the nuclear changes that occur during the development of double fertilised eggs of the sea urchin have made his name famous in science. In sea urchin's eggs, he showed that there are three types of dispermy, i.e., the tetraster, the triaster, and the double spindle type of mitosis. The tetraster type of division was produced by adding a very large quantity of sperm to the eggs and violently shaking or pressing the ova; the resulting larvæ were nearly all pathological, and only a few normals were found. The triaster type of division was produced by shaking the eggs immediately after fertilisation; these gave rise to a large number of normal as well as pathological embryos. The double spindle type occurred more rarely after the above procedure and gave rise to normal larvæ, or at the most asymmetrical larvæ. Boveri then showed that the pathological defects in dispermy were not due to the protoplasm, but to a wrong combination of the chromosomes in the nuclei. From these cells of the first division, daughter cells were formed that had a definitely abnormal chromatin-complex (*chromatin bestand*). Hausemann later showed that the nucleus of the malignant cell also contained this abnormal chromatin-complex. Boveri now states that the malignant cell is one possessing an irreparable defect of the nucleus, which is due to a definite and wrongly combined chromosome-complex and is the cause of the tendency of these cells to undergo rapid multiplication. Eighteen reasons are given in support of the view, which discuss how the different predisposing causes, viz., irritation, chemical, parasitic, etc., may all produce these changes in the nucleus; the cell then inherits a disposition to divide rapidly and form malignant tumours. This book is a classic and should be read by all who are interested in the theory of the causation of malignant growths. Boveri discusses his theory very ably, but largely from a cytological point of view, and in doing so gives a very clear picture of how aberrant mitosis may be caused, and in turn give rise to abnormal cell proliferation (growths). The explanation of how these cell proliferations give rise to (1) benign growths, where the proliferation is slower, the cell development normal and the tissue reaction marked, i.e., capsulated; or (2) malignant growths, when the proliferation is more rapid, cell development abnormal and there is very little tissue reaction, so that lymphatic permeation occurs; is not made clear. The reviewer is very partial to the cell-rest theory:—congenital (Cohnhein), or acquired (Unna), and Boveri clearly shows how these cells may inherit an abnormal chromosome-complex predisposing them to multiply rapidly and form malignant growths. On the other hand there may be cell-rests with a normal chromosome-complex, so that the cells multiply normally and produce innocent tumours. Boveri discusses the exciting factors that give the stimulus to this cell multiplication, such as irritation, etc. Very little attention is paid by him to the local responses of the tissue against its invasion by these abnormal cells when this resistance is lowered (e.g., in *X*-ray burns, Kangri cancer, etc.), but sometimes it is very high as in atrophic carcinoma of the breast. With normal cells the growth is usually encapsulated. There are also general factors that inhibit or stimulate cell growth that are not discussed; and probably have an effect in determining the age incidence of carcinomas and sarcomas.

H. W. A.

THE DERMATERGOSES OF OCCUPATIONAL AFFECTIONS OF THE SKIN.—By R. Prosser White, M.D., M.B., C.M.Ed., M.R.C.S. (Lond.). London: H. K. Lewis and Co. Ltd. 1928. Third Edition. Pp. XI plus 734 with 52 plates including 58 figures in the text. Price, 35s. net.

THIS is the third edition of this well known work on *Occupational Affections of the Skin*, and is illustrated with exceptionally fine photographs. The book is a mine of information on the subject, and as the author states in his preface, Miss Anne Newbold's unstinted help and intimate acquaintance with contemporary dermatological literature has added much to the usefulness of the work by the numerous references given on each page, as well as a general index of authorities. Naturally there are several small points in this book that one would quibble at, such as the use of the term "dermatergoses," and towards the end of the book "war dermatoses," etc. Sequeira has stated in his book that veldt sore is caused by the Klebs-Loeffler bacillus, and everyone is now quoting this statement. This disease was first described by Bishop Harman during the South African war, and he thought the causative agent was an intracellular coccus. The two lesions are totally different clinically, as well as bacteriologically.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The book should be in the possession of every dermatologist and medical officer who has to deal with occupational diseases, as it will give him all the knowledge he requires to diagnose the different lesions seen in the skin of workers in the different trades.

H. W. A.

A SHORT PRACTICE OF MEDICINE FOR STUDENTS AND JUNIOR PRACTITIONERS.—By U. P. Basu, M.B. (Cal.), M.R.C.P. (Irl.), Teacher of Medicine, Calcutta Medical School. Pp. 827. Calcutta: Kamala Book Depot. 1929. Price, Rs. 10 net.

THIS work is an attempt to present to the Indian medical student the essentials of his medical teaching in short compass. The author quotes in his preface an editorial in this journal suggesting that the medical curriculum in India is over-loaded, and that it ought to be revised and reduced. In the present work he has attempted this task—to present the minimum essential for the medical student in the tropics, and to eliminate the non-essentials.

The arrangement of the chapters in the book is in consequence new and interesting. The author deals first with the chief tropical diseases, then with world-wide specific infectious diseases, then with diseases of the different systems, and finally with the diseases of children. This plan has much to recommend it from the practical point of view in the tuition of medical students in India. A special feature of the book throughout is its numerous prescriptions; to the medical practitioner who has largely forgotten his materia medica these will be especially useful.

The book is not especially original, though it is essentially practical. The section on diseases of the circulatory system will command special attention, since the author has especially studied this subject, and was for some time cardiologist to the Howrah General Hospital. In general, it may be said that the book is a reproduction of the author's lectures to his students.

A special feature of the book are the 15 half-tone reproductions of diseased states. These vary in merit. Some are very good indeed.

The coma of typhoid fever, the swelling of epidemic dropsy, the cancrum oris of kala-azar, are very well illustrated, also—especially—the photograph of a patient suffering from amyotrophic lateral sclerosis. A few of the reproductions however are very disappointing; for example, the publishers must surely have made some mistake about the illustration facing p. 221, showing a case of cerebro-spinal fever. One supposes that it is intended to illustrate Kernig's sign, but it is very defectively reproduced.

The book is written especially from the Indian standpoint, and will therefore make a special appeal to Indian medical readers. It is the result of several years of study and teaching under Indian conditions, and therefore to be recommended. There are a number of typographical errors which we should like to see corrected in a second edition; but, on the whole the get up and format are excellent; the volume is of a most convenient size, neither too large nor too small for the subject which it covers.

R. K.

A TEXTBOOK OF PHARMACOLOGY AND THERAPEUTICS.—By Hugh Alister McGuigan, Ph.D., M.D. Philadelphia and London: W. B. Saunders Company, Ltd. Pp. 660. Illustrated. Price, 28s. net.

WITHIN the last few years a number of textbooks have been published on pharmacology and therapeutics and the appearance of another book may seem superfluous. A perusal of Professor A. McGuigan's book, however, will convince the readers of its intrinsic worth and special field of utility. The aim of the author is to present the important facts in pharmacology with special reference to their therapeutic and clinical application, so that the student or the practitioner of medicine, instead of being guided by pure empiricism, will have a scientific and rational knowledge of the changes produced in the system by the drugs which he employs. In fact the real interest of pharmacology lies more in its relation to the treatment of disease than its purely biological aspects. With this idea in view the author has attempted to connect together the essential facts of pharmacology with physiology, biochemistry and clinical medicine, and in this he has been eminently successful. At the beginning of almost every chapter there is a concise and clear exposition of the physiological principles on which a proper understanding of the pharmacological facts depends which is very illuminating to the reader.

Schematic diagrams have been freely inserted in the description of "cathartics," "digitalis," "pharmacology of the ganglia," etc. These are very instructive and are calculated to arouse keen interest in the contents of the chapter. In the chapter on digitalis the different forms of cardiac irregularities have been discussed in small print, a section which at once makes the subject more readable and acceptable to students who are saved the trouble of referring to books on medicine to refresh their memories.

Credit must be given to the author for including almost all the recent developments in the realm of pharmacology and therapeutics in a short space. Egglestone's rapid method of digitalising a patient, the action and uses of colloidal metals, the use of quinidine in heart diseases, the newer derivatives of quinine and cocaine, etc., are worthy of mention in particular. It is strange that the newer conceptions about post-pituitary extract have not been included, and in view of the growing importance of physical chemistry to pharmacology, the primary principles of ionic theory and the theory of salt action might have been considered in a little more detail.

The most important drawback of the book—and this it possesses in common with most other books of English and American origin—is the lack of proper consideration of the drugs used in tropical diseases. Thus antimony in kala-azar and schistosomiasis, the cinchona alkaloids in malaria, chaulmoogra oil in leprosy, etc., are all dealt with very briefly, and these sections are not likely to satisfy the requirements of students in the tropics. The new bismuth preparations for the treatment of syphilis have not received the amount of attention they can legitimately claim, and ephedrine has been awarded only an insignificant corner which fails to impress readers with its importance in therapeutics. Kymographic tracings—so essential in pharmacology—are curiously enough very few.

The book is well printed, is written in a readable style, and we have no hesitation in recommending it to students and practitioners alike.

R. N. C.

A HANDBOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY.—By Aughore Nath Das, Teacher of Medical Jurisprudence and Toxicology, Bankura Medical School. Pp. 232. Calcutta: the Book Co., Ltd. 1929. Price, Rs. 3-8 net.

THIS little book is intended mainly for students for the Licentiate of the State Medical Faculties in India, and is a welcome addition to the already considerable volume of reliable, yet cheap, textbooks for Indian medical students. The book is based upon the author's lecture notes and his 28 years' experience of medico-legal work in Bengal. The book follows upon the usual lines, but it is well put together, and written with special reference to Indian conditions, which adds to its value. The printing and type are good, and the general get up of the book excellent. Useful appendices deal with those sections of the Indian Penal Code which are applicable; detailed instructions with regard to sending specimens to the Chemical Examiner's department for examination, and question papers set at examinations.

Both the author and the publishers are to be congratulated on an eminently practical and useful work, which will make a special appeal to Indian students and practitioners.

R. K.

ALCOHOL AND HUMAN LIFE.—By Courtenay C. Weeks, M.R.C.S., L.R.C.P. London: H. K. Lewis and Co., Ltd. 1929. Pp. 201 with 5 illustrations. Price, 3s. 6d. net.

Alcohol and Human Life is a revised edition of the well-known book by Sir Victor Horsley, but in an

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dietetics and Disease

Statistics show that a considerable percentage of children of school age are prevented from attendance on account of tubercular trouble, of general debility and of complaints connected with vitamin deficiency.

From the accumulated evidence on the subject it is obvious, since the average diet is usually lacking in vitamins, that the addition of a suitable extra-dietary vitamin preparation is required for the prevention and amelioration of the many troubles associated with deficiency diseases.

Radio-Malt is the ideal preparation for this purpose because it contains vitamins A, B_1, B_2, and D *in scientifically-standardised amounts;* its value in the prophylaxis and treatment of many diseases is appreciated universally by physicians. Radio-Malt promotes healthy growth, and corrects faulty calcium and phosphorus metabolism ensuring proper development of bones and teeth; also there is evidence as to its value in the treatment of tuberculous and run-down conditions in patients of all ages.

It is made by the most up-to-date machinery, and, from first to last, in no part of the process is the product or any one of its ingredients touched by the hand. Radio-Malt is manufactured by a special process and packed in hermetically-sealed glass jars for export to the tropics. Physicians are warned that only the special hermetically-sealed product is suitable for use in India.

RADIO-MALT

Descriptive literature will be sent on request to either of the B.D.H. representatives resident in India:

HENRY S. CLARK
8/10 Waterloo Street
Calcutta

BYRAM MISTRY
119 Parsee Bazar Street
Fort Bombay No. 1

THE BRITISH DRUG HOUSES LTD
LONDON

Vit.Pr/In/2911

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TRADE **'EUKODAL'** MARK

Morphine Substitute

ANALGESIC and SEDATIVE

Equal in therapeutic value to morphine, its toxic by-effects are much less marked.

It may be given in all cases where morphine is indicated, in addition to which it is of peculiar value in cardiac disease. Habit formation develops much more rarely and much later than in the case of morphine.

The necessity for increased dosage does not arise as rapidly as in morphine administration.

Eukodal has attained a position of pre-eminence as a narcotic, advantageously replacing morphine.

Eukodal is distinguished by its pharmaceutical purity, comparatively low toxicity and uniform therapeutic effect.

PACKING: Tablets 0.005 gm. tubes of 10 and 20
Ampoules of 0.01 gm. in 1 c.c. Boxes of 5 and 10
Ampoules of 0.02 gm. in 1 c.c. Boxes of 5 and 10

E. MERCK CHEMICAL WORKS **DARMSTADT** (GERMANY)

Represented by Messrs. MARTIN & HARRIS Ltd., CALCUTTA, BOMBAY, MADRAS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

entirely new guise. It has been thoroughly rewritten, entirely recast, and much additional matter has been incorporated, in order to bring the subject-matter up to date and in a line with the present development of sociological ideals. The aim of the author, as has been set forth in the preface, is to deal with the alcohol question from a scientific point of view and to convince the readers of the great calamity that indulgence in alcohol is bringing to mankind, so that social workers may have a clear idea of this scourge to the nations' life.

After a note on the harmful effects of alcohol on the different systems of the human body, in the course of which the author has tried to put down his ideas in as clear and lucid a manner as possible, he passes on to deal with the great national question "the child and racial poisons." In this chapter he discusses the three racial poisons—lead, venereal disease, and alcohol—and has tried to bring forth in a comprehensive way the truth of the dictum "alcohol is a menace to child life in all stages of existence." Dealing with the influence of alcohol on national life, he tries to impress on the mind of the reader that alcohol is responsible in a direct and indirect way for national degeneration and misery. He has given statistical proof in support of his various arguments, and throughout the body of the book we find numerous records of facts and figures which the author has taken great pains to collect, and these have added greater weight to the arguments and conclusions that he has put forward.

When dealing with the sociology of the subject, the author speaks with conviction and emphasis and this makes the book especially interesting. A fresh chapter indicating the lines on which an anti-alcoholic campaign —a vital question—could be carried out would have been much appreciated by the social service workers and would certainly have enhanced utility of the book still further.

R. N. C.

AIDS TO PHARMACEUTICAL LATIN.—By G. E. Trease, Ph.C. London: Baillière, Tindall and Cox. 1929. Pp. 168. Price, 3s. 6d. net.

Aids to Pharmaceutical Latin is a small handbook of the *Students Aid Series* giving a concise account in English of Latin grammar, phrases, abbreviations, etc., used by pharmacists in general. The need for a book of this nature is perhaps not likely to be keenly felt at the present time, in view of the fact that the Latin terms used in medicine and pharmacy are being so largely replaced by directions in English language. Nevertheless there is no denying the utility of this book. It is an admirable book for purposes of reference to students and practitioners who are confronted with difficulties regarding the interpretation of technical Latin phrases and abbreviations which so commonly come into medical practice. The Latin-English vocabulary at the end is a comprehensive chapter and it will certainly prove useful to everyone in finding out English equivalents of pharmaceutical Latin. The section dealing with phrases and abbreviations used in prescriptions is worthy of special mention and will be much appreciated by students.

R. N. C.

MEDICAL GUIDE FOR INDIA AND INDEX OF TREATMENT.—By E. I. O'Meara, O.B.E., F.R.C.S. (Eng.), D.P.H. (Cantab.), Lt.-Col., I.M.S. (retd). Third Edition. Revised, rewritten, and enlarged throughout. Calcutta: Butterworth and Co. (India), Ltd. 1929. Pp. XIV plus 1138. Illustrated. Price, Rs. 15 net.

O'Meara's *Medical Guide for India* is an old friend of medical practitioners in this country and the appearance of a third edition after a period of five years will certainly be welcome. To those who are familiar with the previous editions, the present volume will cause surprise, inasmuch as it has undergone a complete change and it is difficult to recognize the original in this edition. The book has been thoroughly revised and in many places entirely rewritten. Incorporation of new material has been carried out with a free hand so as to bring the book up to date and in line with the recent developments of medical science. There is also plenty of evidence of rearrangement and regrouping of the subject-matter in different sections of the book. The more important sections have been written by specialists in their own subjects. Sir Leonard Rogers has written the sections on malaria, cholera, leprosy and emetine; and a host of other eminent authorities such as Sir Arbuthnot Lane, Colonel Graham, etc., have also enriched the book with their contributions. The task of selection of subject-matter for the book again must have been a difficult task in view of the enormous and ever-increasing output of literature on all manner of subjects, and credit must go to the author for the admirable way in which he has tackled the problem.

The *Index to Treatment* does not appear to have received the consideration it should have done at the time of revision. Little attention has been paid to the subject of filariasis. Pregnancy anæmia has not been mentioned in spite of the fact that recent researches have definitely proved its separate entity from pernicious anæmia. Some of the prescriptions seem to be rather old fashioned. Such ingredients as koto, jambal, pareira, sarsæ, rhamni, purshiani cortex, etc., are useless relics which are not easily available nowadays and will not be served with good grace by the present-day dispensers.

The addition of a bibliography at the end of every chapter is another feature of note and importance. It sums up the latest and most important literature on the subject without attempting to be too detailed and complete. The book we have no doubt will be useful to general practitioners in this country.

R. N. C.

CROOKS OF THE UNDERWORLD.—By Charles George Gordon. London: Geoffrey Bles. Price, 5s.

When Mr. George Dilnot, who has written several books of the *Famous Trial Series*, was editing *The Detective Magazine* he received a visit from a personage who produced entirely satisfactory credentials as being one of London's master crooks, and Mr. Dilnot vouches for the authenticity of these remarkable reminiscences of London's underworld.

Gordon is of course an assumed name. It was the late Mr. A. C. Fox Davies, the well-known barrister, who defended Gordon in the treacle plaster case, who suggested that Gordon who has a long criminal record should write his exploits and experiences. It is the plain unvarnished tale of a man who took to crime from the age of thirteen and who claimed to have made £5,000 a year by every possible means of refined swindling and burglary, and who as a result has spent several years of his life in prison. Tired of this mode of precarious living, especially on release after serving a sentence of seven years for a crime of which he and his counsel declare he was entirely innocent, he resolves to "go straight" for the rest of his life.

The fallacy of the dictum once a criminal always a criminal is well exemplified by Gordon's attempt to successfully sublimate his criminal propensities after many struggles, by adhering to the new leaf that he has turned over.

It is the story of a tragedy written with a certain vivacity; and is also a concise exposition of the numerous methods of "graft" that are known to the underworld. The vivid descriptions of prison life contain abundant food for thought for those who pose as reformers of our penal system, for it seems incredible that such penalties as the "no talking order" and "cold storage" still exist.

J. N. J. P.

C. MENSE, HANDBUCH DER TROPENKRANKHEITEN.—Fifth Vol. 3rd Edition. Joh. Ambr. Barth, Leipzig, 1929. Pp. XI plus 846. Illustrated. Price, Rm. 90 (£ 4-4-0).

The present volume is the last one of this voluminous handbook—at least the last dealing with human diseases; a sixth volume will discuss the veterinary ailments peculiar to hot countries.

The present volume contains the following chapters: "Diseases caused by worms" by G. Sticker (under collaboration of Schueffner and Swellengrebel);

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"Recurrent fever" by H. Ruge, followed by smaller chapters on Nanukayami (Japanese seven-day fever), bronchial spirochætosis, *sodoku* and various other spirochætoses by the same author, "Chagas' disease" by Chagas and da Rocha Lima, and "Yellow fever" by Couto and da Rocha Lima. A very useful editorial appendix (by Mense) deals with many more locally important troubles, alphabetically arranged according to their most popular vernacular name. Of course, only such diseases are mentioned to which references in the world's medical literature exist, like "spider-lick," "Rhim valley fever," "sutika," etc.

The larger half of the volume is devoted to the first chapter; this is divided in two parts, the first one dealing with general views, biology and zoology of the different helminths pathogenic to man, their geographical distribution, diagnosis, laboratory methods, general treatment and prophylaxis. A very interesting paragraph discusses the possible importance of worms in the spreading of infectious diseases (e.g., typhoid). A short introduction to the first part gives an admirable account of the history of worm diseases, the knowledge of which is traced back as far as to the Ayyurveda and papyrus Ebers (the latter mentions *Ascaris*, *Tænia* and *Dracunculus medinensis*).

Whereas the biological and zoological section is well up to date, we regret to state that the chapter on treatment is not at all satisfying. The arrangement is not lucid at all and one fails to trace the point of view, according to which it is done. Old and obsolete methods are mentioned, which might belong equally well to the historical introduction or might even be omitted altogether. The practitioner of to-day is not at all interested into the use of tin or corallina officinalis in the treatment of ascaris or tænia infections and we doubt whether he will agree that extr. filic. mas. is still the safest and most effective drug against hookworm. And here is the weak spot of the whole chapter; the learned author does not seem to be very familiar with or at least to have a wide personal experience of the modern ways of treating helminthic diseases. The value of carbon-tetrachloride is nowadays beyond all doubt, and if deaths were reported in the beginning from various quarters, still anybody working in tropical countries knows how to avoid such accidents. The same applies to the antimony treatment of schistosomiasis: it sounds strange indeed, that the author should doubt the possibility of ascertaining the cure-rate among 6,500 bilharzia patients (Khalil); tropical diseases are mostly mass diseases, where everything depends upon the method employed. A physician used to mass-treatment is certainly also familiar with the control of the same. The toxicity also of tartar emetic and more especially of the modern organic antimony compounds is certainly overrated: after all, antimony is to-day the only life-saving drug in schistosomiasis and certain risks have to be faced and, if possible, overcome.

The second part of this chapter deals with the special diseases. According to their importance, filariasis, schistosomiasis and hookworm are especially considered. The section on hookworm seems to us the best of the whole chapter, although we again can hardly agree with the remark: "CCl_4 is not to be recommended for mass-treatment." After all, CCl_4 *has been* used for mass-treatment for many years and a modern handbook on tropical diseases should not overlook this fact.

Besides these points, which we hope to see corrected in a next edition, we find much valuable information, and the epidemiological and pathological chapters are extremely well dealt with.

References are given to the latest publications on helminthology only; the older literature is referred to in various hand- and textbooks.

The monograph on relapsing fever by H. Ruge is certainly the best part of the book, and from the first to the last page it affords interesting and sometimes fascinating reading. This rather difficult subject is exhaustively dealt with in 108 pages and shows the great personal experience of the author. The section on transmission shows wonderful enlarged photographs of the 16 most important species of *Argas* and *Ornithodorus;* to each photograph a schematic sketch is added and a table gives in a clear and comprehensive manner the important distinctive characteristics: thus the text on this difficult subject is cut down as much as possible, but whatever is omitted in the text is explained much more clearly through the pictures and diagrams.

The part on the different spirochætes responsible for relapsing fever is very extensive and up to date. So is the chapter on serology. The clinical paragraphs are very detailed: the Russian-European and the African (East- and West-African) type of the disease is considered in length, but also the East-Indian type is dealt with in full with references to the work done by Carter, Graham, Mackie, Cragg and others. The bibliography includes 1,170 references.

The next chapters on various spirochætoses are also very comprehensive, and of special interest to readers in India is a short paragraph on bronchial spirochætosis, which the author believes to belong to the group of fuso-spirilloses. We cannot but congratulate the author on this comprehensive section.

There follows a large chapter on the American trypanosomiasis, Chagas' disease, written by Chagas with the collaboration of Enrico Villela and H. da Rocha Lima. There is nothing to say about this very learned monograph, which gives a clear picture of this comparatively only recently studied disease.

The last chapter by M. Couto and H. da Rocha Lima deals with yellow fever. History, symptomatology and epidemiology of this dramatic disease are extensively dealt with. Rocha Lima gives an excellent account of pathology and histology. The question as to the ætiology of the disease naturally forms the centre of the monograph and we may say that it is completely up to date. The researches of the late Dr. Noguchi are given in full detail and we follow, as in a thrilling novel, the foundation and erection of his monumental hypothesis and again its dramatic destruction, started by Manson-Bahr, Schueffner, Aragao, completed by the self-sacrificing work of Stokes, Young and their collaborators and buried with the gallant inventor. Finally an editorial note by Mense considers the most recent work of Kuscinsky, Berlin, who in the early months of 1929 considered the *Bacillus hepatodystrophicans* as the causative organism, and who with his laboratory assistant, Frl. Hohenadel, underwent the "experimentum crucis" and developed a typical yellow fever; but with more luck than their unfortunate predecessors, Noguchi, Young and Stokes, both recovered.

In conclusion, we may say that the last volume of Mense's handbook is again packed with valuable information. The print is excellent and one cannot but admire the multitude of splendidly coloured plates and photographs. The book is undoubtedly a most valuable contribution to the library of any medical man practising in the tropics.

O. U.

(*Note.*—This book has not been sent to us for review but, as the subject-matter is likely to be of interest to our readers, we are printing this review which was written especially for the *Indian Medical Gazette.*—EDITOR, *I. M. G.*)

CANCER.—By G. Jeanneney. Translated by J. Gibson M.C., M.A., M.D., and J. H. Watson, F.R.C.S. Pages XIV plus 186, with 33 illustrations. Price, 7s. 6d. net. London: H. K. Lewis & Co., Ltd. 1929.

THIS is a small handbook translated from a French work by Professor Jeanneney, and is intended for the general practitioner.

The essential point in the treatment of cancer is to make an early diagnosis and this rests with the general practitioner. The book deals entirely with clinical findings. No words are wasted and the descriptions are clear and sharp cut. The English translation is in many ways reminiscent of that famous work Lejar's *Urgent Surgery.*

Every surgeon will benefit by reading it, and every general practitioner should read it carefully and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BOVRIL Limited cordially invite any medical man visiting England to inspect their factory at any time.
148-166, Old Street, London, E.C.1.

The Value of BOVRIL in illness

Beef has well authenticated special powers of stimulating cellular activity, of restoring the tissues of the body and of toning up the whole system.

Bovril contains these powers in a highly concentrated, effective and digestible form. That is why Bovril has been recommended for years by the medical profession to meet the extra demands of enfeebled systems during convalescence.

BOVRIL

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Lacquin

REGD.

"THE TONE FOOD OF THE TROPICS"

(Pure Milk and Quinine in Powder form blended with Coffee)

THIS is the new "Cow & Gate" Product—introduced with confidence to the Medical Profession in India as a valuable tonic nutrient in tropical fevers and in the debility and enervation consequent upon residence in hot climates.

In **"Lacquin"** Quinine Sulph. B.P., has been combined with a pure milk base and blended with fine coffee. By the simple addition of hot water a most agreeable beverage of the coffee type is prepared, the bitter and objectionable taste of the Quinine being effectually masked.

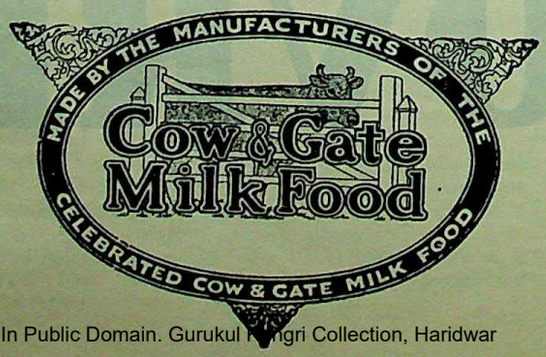
Each breakfast cupful of **"LACQUIN"** contains 2½ grains of Quinine and 2 cups per day will therefore give the regulation dose of 5 grains.

"LACQUIN" is more than a mere vehicle for the pleasant administration of Quinine. The exceptional tonic and nutritive properties of pure English milk are conveyed to the system and enable it to resist Malarial and epidemic infection.

Distributed in India by

SMITH STANISTREET & CO., LTD., CALCUTTA.

Who will willingly send samples and literature on request.

Guildford 

England.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

repeatedly. In its 186 pages he will find all he needs to know about malignant diseases affecting any part of the body.

The book concludes with a chapter on the methods adopted in France for the prevention and treatment of cancer, and one on the cancer campaign in Great Britain.

A. H. P.

MEDICINE, ITS CONTRIBUTION TO CIVILIZATION. —By E. B. Vedder, A.B., M.D., F.A.C.S. 1929. London: Baillière, Tindall and Cox. Pp. 398 plus IX. Price, 22s. 6d. net.

THE object of this book is to present to the lay reader in simple language, devoid of technicalities, a brief account of the achievements and the ideals of Western medicine. Such an undertaking is not so simple as might at first sight appear, for the author has to avoid over-technicality on the one hand and an equally strong tendency to 'talk down' to his readers on the other. On the whole, Colonel Vedder has successfully accomplished his difficult task.

The book is divisible into two parts—Part I (comprising 254 pages) deals with the causes of disease and Part II with 'Present Accomplishment in Disease Prevention and the Problems of the Future.' Any criticisms the reviewer has to offer deal with minor points.

Table 13, giving the composition of ordinary food materials, extends over five pages and appears to be a little too exhaustive for the purposes of the present work. Beyond the brief remark that 'In some cases that recover the mind is permanently deteriorated,' nothing is said of the appalling sequelæ of encephalitis lethargica. In the experience of competent workers the number of persons who have been rendered mentally defective by this disease runs into thousands—in Great Britain alone. It is doubtful whether the classification of goitres (on p. 200) is intelligible to a non-medical reader; *per contra* there is no mention of plasmochin in the treatment of malaria.

Of actual errors there are a few calling for comment. We thought we had detected one such at page 5 in the author's statement that.....'there are roughly two billions of human individuals on the earth'.....until we recollected that in America a billion means a thousand millions not a million millions as in England.

On page 76 there is a misquotation of Kipling and we are still puzzling over two sentences on the page following, viz., that "The tertian parasite (of malaria) requires seventy-two hours to complete this development".....(the human cycle) and that "The quartan parasite requires eighty-four hours to complete its cycle of development'.....

Surely *Trypanosoma gambiense* is not carried by *Glossina morsitans* under natural conditions? (p. 85). It is not, in our opinion, desirable to use the phrase 'black water fever' (p. 95) as synonymous with 'Texas cattle fever'; 'red water fever' is the more usual term for this piroplasm infection.

There are also some printing errors, the most outstanding of which (at p. 263) is the translation of the Roman emperor Justinian to a remote period when the founders of Rome's future greatness were clinging precariously to their seven hills on the Tiber.

Binding and general format are good and the price is reasonable.

J. M. H.

Annual Reports.

ANNUAL REPORT OF THE UNION MISSION TUBERCULOSIS SANATORIUM, AROGYAVARAM, NEAR MADANAPALLE, SOUTH INDIA, FOR 1927-1928.

THIS annual report is always of interest, for the Arogyavaram sanatorium is one of the very few bright spots in the tuberculosis problem in India. It is most efficiently managed, and is situated in an ideal climate free from dust.

The report for 1927-28 is written by Dr. R. H. H. Goheen, B.A., M.D., in the absence on leave of Dr. C. Frimodt-Möller. The report, as usual, is illustrated by most interesting photographs, showing the types of open-air wards adopted for a tropical climate, the surrounding scenery, *X*-ray rooms and laboratory department. The sanatorium was officially opened in 1915, and has done splendid work ever since. Its grounds cover more than 100 acres with some 90 buildings in them. The climate is dry and temperate; the institution is financed by fourteen missionary societies, but is very largely dependent on the income from paying patients and on voluntary contributions. The lines of treatment adopted are essentially those adopted in up-to-date clinics in Europe. There are 8 general wards with a total of 116 beds; 2 semi-general wards, each with 4 beds; also special wards; the total accommodation being for 182 patients.

During the year 312 patients were admitted and 284 discharged, the daily average number of patients under treatment being 164. The patients are of all communities, castes, and races, whilst no less than 284 came from outside the Madras Presidency—a sufficient indication of how widespread are the activities of the sanatorium, and how badly it is needed.

Results emphasise the imperative necessity for the diagnosis and treatment of pulmonary tuberculosis at a far earlier stage than is at present the case in India generally. The figures are as follows:—

	Arrested.	Much improved.	Improved.	
Stage I ..	85.3	9.8	3.2	per cent.
Stage II ..	23.1	42.3	5.8	"
Stage III ..	2.4	27.4	13.7	"

A second table shows how very important is the finding or otherwise of tuberculosis bacilli in the sputum on admission with regard to prognosis. In all stages those patients with bacilli present in the sputum show a much worse prognosis than those cases where the bacilli are so scanty as not to be found on microscopical examination. Fever, after admission, in the discharged cases lasts on an average for about 45 days. The average increase of weight in discharged cases was 11 lbs.

Artificial pneumothorax was tried in 57 cases during the year; induction was successful in 40, of whom 19 were discharged with positive results. Sanocrysin was tried in only 28 cases; and tuberculin B.E. in only 12. It is clear from these figures that, apart from artificial pneumothorax, which plays a very definite rôle in the treatment of pulmonary tuberculosis, the general tendency is towards rest and allowing the natural processes of healing to occur.

A recent feature of the work at Arogyavaram has been the institution of a well equipped laboratory and the increasingly arduous nature of its duties. It is run by Mr. R. M. Barton, M.A. (Oxon.), and an immense amount of laboratory diagnosis of all types is called for during the year. The new *X*-ray department has been in continuous use since August 1927, and is not only useful for routine examination of the chest, but also for other radiological examinations; in fact, in pulmonary tuberculosis, just as in leprosy, secondary infections and diseases appear to play a most important part in prognosis. Ultra-violet light treatment has been found to be especially valuable for the treatment of extra-pulmonary tuberculous complications.

During the year a new general male ward with 18 beds was opened; also 3 double wards with 6 beds in all. Medical training was given to both post-graduate and under-graduate students, and to laboratory assistants sent from different places. A sale of goods manufactured at the sanatorium helped by bringing in Rs. 400. The members of the staff have contributed a number of papers to medical journals, including two contributed to our columns by Dr. Frimodt-Möller. Income totalled Rs. 1,25,425 and expediture Rs. 1,23,065, showing on how near a margin this splendid work is being carried on. A list of rules for admission, which should be most carefully studied by any medical practitioner wishing to send patients to the sanatorium, closes the report.

"Arogyavaram" is in the forefront of the campaign against pulmonary tuberculosis in India. We can only

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

wish the sanatorium a continuance of its most important sphere of useful and life-saving work.

UNITED FRUIT COMPANY. MEDICAL DEPARTMENT. SEVENTEENTH ANNUAL REPORT, 1928. BOSTON, MASSACHUSETTS. Pp. 381; PROFUSELY ILLUSTRATED.

We wish that considerations of space did not prevent us from doing full justice to this wonderful report. Year by year the annual reports of the Medical Department of the United Fruit Co. become more and more important contributions to tropical medicine. The present report is the equivalent of an annual volume of a monthly journal of tropical medicine. It is lavishly illustrated, and admirably published. The United Fruit Co. takes the health of its employees in the vast region over which its plantations are dotted very seriously; it has a very fine medical staff, splendid hospitals and laboratories, and an admirable medical organisation. The result is that this volume is more than a dry statistical report; the necessary statistics are included (at the end), but the entire volume is a notable contribution to tropical medicine. How up-to-date the Company is is illustrated by the photographs of the large aeroplane regularly used as a means of transportation of medical officers to various inland points in the Tela Railroad Division, and also utilized to bring patients from the interior to the Tela Hospital.

Dr. W. E. Deeks and the United Fruit Co. are to be congratulated on the notable contributions to the study of tropical medicine which these annual reports constitute.

Turning to the substance of the report, apart from the general report and statistical section, it includes no less than fifty-five papers dealing with different problems in tropical medicine and surgery, together with reviews by Dr. W. M. James of the last edition of Stitt's *Diagnostics and Treatment of Tropical Diseases,* and of Dobell and Laidlaw's recent studies of *Entamœba histolytica.*

Malaria is very fully dealt with. Plasmochin and Plasmochin Co. have been exhaustively studied by the medical officers of the Company. Barner and Newman have confirmed the crescent-destroying action of this compound by mosquito tests on patients on plasmochin treatment. Brosius reports on "blanket treatment" with plasmochin—i.e., mass treatment of all persons showing gametocytes—as a measure of malaria control. Reports of malaria surveys follow, especially one by Clark which deals with conditions among the aboriginal Caribs of Central America, and is therefore of special value as determining malarial conditions in an aboriginal population in Central America. How thorough is malaria control by the United Fruit Co. is shown by the splendid set of photographs of hospitals which are included; there is not a window or verandah not properly screened. Rojas gives an interesting account of pernicious cases of malaria; indeed throughout the whole report its special clinical value is very great. Other papers deal with the value of adrenalin in malaria, observations on induced malaria, and the medico-legal aspects of malaria with reference to accidents. Professor Whitmore of Georgetown University contributes a full biochemical study of the blood in blackwater fever; he comes to no conclusions, but establishes valuable data.

After this section there follow a large series of papers of clinical importance. Tropical skin diseases, tropical ophthalmology, tropical surgery, and snake-bite are subjects dealt with in this series. Throughout, papers are admirably illustrated. In his covering letter to the report Dr. Deeks is able to write as follows:—"With the exception of six cases of leprosy among nationals, no quarantinable diseases have developed in any of our divisions during the year; nor has any infectious disease assumed serious epidemic proportions." It is a summary of very fine work carried out under tropical conditions, and of great interest from every aspect—epidemiological, medical, and clinical to other workers in tropical medicine.

As no price is mentioned, we take it that this annual report is only for official circulation, but the larger medical libraries in India should certainly contain copies. The editor is Dr. W. E. Deeks, Medical Department, United Fruit Co., 17, Battery Place, New York.

A publication such as this leads one to wonder whether such industries as the Indian Tea, Jute Mills, and Mining Associations, or the Bengal Chamber of Commerce, could not publish a similar series of annual reports, for much valuable work is being done by the medical officers of these associations, and far too little of it is published in the journals. In India so far we have not attained anything like the wonderful standard of disease prevention and control that the United Fruit Co. have reached; still, progress must have a beginning some day, and such reports would be of great interest.

Perhaps what strikes the casual reader of the report most is that anti-mosquito screening is so commonplace a rule in the hospitals, schools, officials' houses, etc., of the United Fruit Co. that it is not worth mentioning; though the admirable photographs throughout the report show it in force everywhere. In India when a planter's bungalow is built, no one worries about whether it is or is not near a breeding site of malaria-carrying anophelines, and no one dreams of mosquito-proofing the house. In Central America the malaria expert is consulted before the house is built, and mosquito proofing of the house is a routine precaution.

Correspondence.

THE AGE OF CONSENT ACT.

To the Editor, The Indian Medical Gazette.

Capulet.

"My child is yet a stranger in the world,
She hath not seen the change of fourteen years
Let two more summers wither in their pride,
Ere we may think her ripe to be a bride."

Paris.

"Younger than she are happy mothers made."

Capulet.

"And too soon marred are those so early made."

Sir,—In Elizabethean times, as in India to-day, early marriage was the rule rather than the exception, but it is obvious that in the days of Romeo and Juliet the dangers thereof were well recognised.

There can be no question that from a sociological point of view, the Bill of Rai Sahib Harbilas Sarda is excellent, but it is open to criticism on its medical side.

The first appearance of menstruation, which in tropical countries roughly occurs between the ages of 12 and 13, coincides with certain general physiological changes which collectively constitute puberty. These changes affect the external genitalia, the internal genitalia, the mammary glands, and the psychical characteristics of the individual which differentiate the woman from the child.

Puberty, which the layman considers is complete on the appearance of menstruation, denotes the physiological co-ordination of the ovaries with other endocrine bodies and therefore there is little doubt that from a natural point of view conception was intended to occur after its appearance, and should there be no great disparity in age between the contracting parties, there is little doubt that the process of nature can be fulfilled without disaster.

Recent research work has shown that the fœtal head approximates in ratio in 80 per cent. of cases to the size and contour of that of the father, and that the uterus adapts the size of its contents in 80 per cent. of cases to that of the maternal pelvic inlet and outlet. Therefore the argument that difficult labour *must* occur as a result of early motherhood cannot be supported, for clinical experience has convinced us that if a primipara be of normal physical development, the process of labour is *not* accomplished with difficulty.

The Age of Consent Bill speaks of "the travails of maternity, and the high maternal and infantile mortality

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The ADDITION of VITAMIN D TO AN INFANT FOOD

EVERY tin of Glaxo sold in your country during the last nine months has contained extra quantities of Vitamin D, added in standardised amounts. The addition is in the form of Ostelin.

This has been made possible since the tasteless, non-fatty, standardised Ostelin Vitamin D preparations have now been thoroughly tested by Doctors; and, after two years of clinical trial in co-operation with eminent infant specialists, the Glaxo Research Laboratories were able to define the optimum quantity of Ostelin to add to Glaxo in order to suit the average baby. This correct, standardised quantity of Vitamin D is now incorporated in all Glaxo.

THE EXTRA VITAMIN D IS ALL-IMPORTANT TO BABIES

It ensures perfect lime absorption with the formation of firm bones, and sound teeth.

The greatest need for lime (calcium) is in infancy when bones, teeth and tissue are being built more rapidly than at any other time in life. Calcium cannot be utilised unless Vitamin D is present in the body. Any shortage of vitamin D will be reflected in imperfect skeletal development or through lowered calcium in the blood stream, in general failure to do well, i.e., lack of tonicity.

It avoids the risk of fat intolerance.

The excessive quantities of fat present in raw milk, and in many milk foods not properly modified, have defeated the very purpose intended; for, consequent upon imperfect assimilation, soap in the stools has resulted. This soap has combined with the lime salts, and the lime salts so essential to the growing infant have been excreted instead of being utilised in building up a sturdy frame. The ability to ensure adequate quantities of vitamin D—to ensure bone formation—without the necessity for unduly large quantities of fat in the food, with its attendant risk of fat intolerance, is a marked advantage of this new Glaxo.

It avoids constipation.

It is a marked feature of Glaxo with added vitamin D that constipation, the bugbear of bottle feeding, is definitely avoided.

Summary

"Sunshine" Glaxo, the new Glaxo with added vitamin D.

(1) contains a definite added quantity of vitamin D.
(2) is humanised and can be used as a supplement to breast feeding.
(3) contains no starch or egg protein.
(4) its use makes it unnecessary to give cod-liver oil to infants.

IN England, as now in India, the new Glaxo is known as "Sunshine" Glaxo. For the tropics it is packed in vacuum sealed tins of the familiar red colour. Every tin of Glaxo sold in India for the last *nine* months has contained "Sunshine" Glaxo. Further information from:
H. J. FOSTER & Co. Ltd., P.O. Box 202, BOMBAY.

The word 'sunshine' appears on the Glaxo tins thus: SUNSHINE

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Worth Remembering!

ADRENO-SPERMIN CO.

(HARROWER)

is still unexcelled for the treatment of ASTHENIA, HYPOTENSION and

NEURASTHENIA.

It is available either in Tablets or Solution and it has proved its usefulness during more than ten years.

To REDUCE BLOOD PRESSURE PROMPTLY

USE

ANABOLIN

Particularly efficient in *functional* high blood pressure.

Ask for interesting literature,

The ENDOCRINE LABORATORY,

SIMLA.

ENDOCRINES LIMITED,

WATFORD, HERTS.

and at 72, Wigmore Street, LONDON, W.1.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

as the result of premature co-habitation," but it should be borne in mind that such travail and such mortality are just as likely to remain high after the passing of the Bill as before it, for it would seem to be forgotten that "travails" have *per se* nothing whatever to do with the age of marriage, but are due to such preventable causes as eclampsia and sepsis. The Bill does not demonstrate how raising the age of consent is likely to ameliorate such diseases, for only intense propaganda and education can do that.

History and literature amply demonstrate that Europe had to face this same problem of early marriage with its frequent tragedies, until medical science proved that it was not so much the age of the primipara, as it was the ignorant dirtiness of midwives, and the lack of knowledge among physicians of the problems of maternity that caused the mortality. This dark age has passed, or is passing, not by virtue of legislation concerning the age of marriage, but because of education and ante-natal care.

As regards infantile mortality which the Bill attributes to early marriage, we must not confound cause with effect, for the appallingly high percentage of infant deaths in India cannot be attributed to this cause. Dr. Ubhaya, Director of Public Health in Madras, has shown that only 0.59 per cent. of first confinements occur under the age of 15, and that 24.7 and 31.2 per cent. respectively, occur between the ages of 15 and 24. These findings conclusively refute the argument of Sir H. S. Gour and, if we may say so, point the legal maxim that "hard cases make bad law," for the infantile mortality is due partly to avitaminosis during the ante- and post-natal periods, and partly to ignorance of the elementary laws of hygiene.

As regards the age limits which are definitely proposed in the Bill, it would seem to us infinitely hard to enforce them in rural India, for in a land where birth registration is unpopular and the age of maturity silently reached, who would be so bold as to give an affidavit on the correct age of a wife, or in the event of extra-marital connection to state truthfully whether Adam tempted Eve or Eve tempted Adam,—for the sex urge is a very vital question in the tropics.

The passing of laws is all very well, but who can bring them to the ears of the people unless there is a general raising of the standard of female education throughout the country. Without such education, preferably in the hands of women teachers, there is grave danger of such laws being used for the sport of blackmailers and those who bring false charges.

Anyhow let us say at once, that the Bill is a real step in the direction of social progress in India and we trust that it will bring into prominence the urgent necessity for intense propaganda on the subject of efficient ante- intra- and post-natal case.—Yours, etc.,

V. B. GREEN-ARMYTAGE, M.R.C.S. (Eng.), L.R.C.P. (Lond.), M.B., Ch.B. (Bristol), M.D. (Bristol), M.R.C.P. (Lond.), LIEUTENANT-COLONEL, I.M.S.,
Professor of Midwifery, Medical College, Calcutta.

CALCUTTA,
14th September, 1929.

(*Note.*—We have been urged by several correspondents to deal with the Age of Consent Bill in our editorial columns, and have hitherto refrained from doing so because the subject is admittedly a very controversial one, and involves deep seated religious and racial customs. At the same time, we are willing to admit correspondence by authoritative writers to our correspondence columns on the subject; although it must be clearly understood that the editor does not accept responsibility for the opinions of contributors.

Colonel Green-Armytage is probably right in claiming that the average age of primiparæ in India is not as low as is usually supposed to be the case. But we doubt whether the Madras statistics are applicable to Bengal. We understand that there is a passage in the Vedas which states that the healthiest first child is born when the father is 35 years of age and the mother 18. The stricter Hindus of Madras possibly follow this rule, whereas we doubt whether the less strict Hindus of Bengal do so. In any case the evidence placed before the Committee appointed to report on the proposed Bill is overwhelming; and, in common with almost unanimous opinion, *we are whole-heartedly in favour of the Bill.* It cannot be right to force pregnancy on children of 12 and 13, whose internal genitalia have not yet fully developed. As the *Statesman* has recently observed, the Bill may be largely a dead letter if it is passed into law as an Act; but its real importance is its educational influence. One can mould public opinion by legal enactments no less than by propaganda. We cordially agree with our correspondent, however, that what is wanted—first, last, and all the time—is education in such matters; clean midwifery in place of filthy *dais*, and an awakening of a public health conscience.

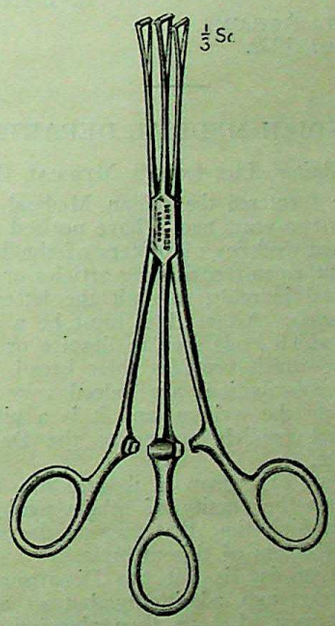
We would welcome statistics from the large maternity hospitals in the different provinces of India as to the average age of Indian primiparæ of different races and castes.—EDITOR, *I. M. G.*)

PERITONEAL FORCEPS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—In this country where anæsthesia is so often far from perfect, the difficulties of the surgeon are increased many times.

One of the greatest of these difficulties is that of bringing the cut edges of the peritoneum together in sewing up the abdominal wall. Mouatts' three bladed peritoneal forceps, though useful when the anæsthesia is perfect, only damage the tissues when the patient strains.



To overcome this difficulty Messrs. Down Brothers, Ltd., have modified the forceps by making jaws similar to those of Duvals forceps, as illustrated.

They are a great success.—Yours, etc.,

MISS M. V. WEBB, W.M.S.,
Principal, Women's Medical School.

AGRA,
19th August, 1929.

THE TREATMENT OF MYIASIS IN LEPERS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Dr. Rau's article on myiasis, which was published in the *Indian Medical Gazette* for July, 1929,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

has prompted me to write briefly concerning my experiences.

In treating the condition, whether it be of the nasal mucosa or of the skin—I have found rectified turpentine quite successful. In the case of the nose, swabs dipped in turpentine have been inserted high into the nares and left there several minutes and then the nares irrigated with weak potassium permanganate lotion. This treatment has needed repetition for two or three days only. In the case of the skin, the ulcers have been dressed with cotton-wool containing a little turpentine and cleansed with a weak antiseptic lotion and the cleaning and dressing repeated once or twice a day as long as necessary.

The result of this treatment is both surprising and immediate. Soon after application the maggots begin falling or crawling out of the ulcers and continue their migration for two or three days until the patient is free: the inflammation and swelling rapidly subside; the foul discharge ceases and the ulcers begin to look healthy again.

I have found no need for surgical interference in cases treated as above, except where a deep sinus has become infested, in which case it has just been opened up in order to allow the drug to have free access to the maggots and to allow of a better exit for the latter.

The turpentine seems to act on the parasites as a stimulant and irritant and causes them to leave the tissues in order to escape the action of the drug. The irrigation with the weak antiseptic assists the larvæ in their efforts to leave the ulcers.

I believe that certain antiseptic lotions and chloroform, if used, kill some of the maggots in the tissues and lengthen the process of recovery, and I fear the use of the Volkmann's spoon or the opening up of burrows with the knife unnecessarily damages the tissues and tends to spread infection to surrounding parts.—Yours, etc.,

E. LANDEMAN,

PURULIA LEPER ASYLUM,
22nd August, 1929.

THE INDIAN MEDICAL DEPARTMENT.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Since I entered the Indian Medical Department almost twenty-two years ago, I have noticed the puzzling and inconsistent tendency of officers of the Indian Medical Department, when contributing articles or correspondence to medical journals, to omit the letters "I.M.D." after their names. After all, it must be a curious type of mentality which leads men to despise or be ashamed of the service which provides their bread and butter. Some of the contributions are indeed very worthy and reflect credit on the writers, and it is a pity that such credit does not publicly accrue to the Department to which it is due.

This tendency of a man to despise his own service must bolster up the enmity of others against that service, and it is high time that men in the service woke up to the foolishness of this attitude.

The I.M.D. to-day is not the Department which it was twenty years ago, admittedly, but we are proud of many of our men. Let us then abandon this stupid policy and feel pride in our service. It is almost a truism nowadays that when one sees "Major, Captain, Lieutenant," or even "Doctor" signed to an article, without "I.M.D.," the contributor is usually a member of that service.—Yours, etc.,

B. J. BOUCHÉ, I.M.D.,
Medical Officer.

JIND JUNCTION,
NORTH WESTERN RAILWAY,
23rd August, 1929.

(*Note.*—Speaking editorially, we would be the very last to decry the Indian Medical Department. The military assistant surgeons are the backbone of the British military station hospitals throughout India, the military sub-assistant surgeons of the Indian military station hospitals. Both groups have carried out invaluable work in the Medical Research Department in India. The record of both in peace and war is alike admirable.—EDITOR, *I. M. G.*

INTRAVENOUS IODINE IN ULCUS TROPICUM.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—We have been using iodine intravenously in all cases of sores which become septic from a slight injury. The patients are all coolie labourers working in manganese and iron mines and the site of the sore is generally on the foot, downwards. These sores are very similar to Naga sore as described in your *Gazette*. The result of iodine injections is quite admirable, but the patient complains of severe unbearable burning sensation after three or four injections. Though the dressings are changed with frequent change of lotions, this is of no avail.

Will you kindly or any of your readers inform us of the reason of this burning sensation?

We make our iodine solution as follows and give injections twice a week; the first dose being 1 c.c., gradually increased to 2½ c.c.

Iodine	..	.. gr. vi.
Potassium iodide	..	.. gr. vii.
Distilled water	..	.. oz. i.

Yours, etc.,

K. P. SARKAR, AND P. B. SARKAR,
Medical Officers.

C/o MESSRS. BIRD & CO.,
BARA JAMDA P. O.,
SINGBHUM DIST.,
B. N. R.

TROPICAL DIETARIES.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—I have the honour to address you on the subject of *tropical dietaries*. I have been making some investigations into this matter, and wish to gain as much information as possible with regard to the following points:—

(*i*) What is considered an optimum caloric value for various classes of labour in the tropics?

(*ii*) The proportion of proteins, carbohydrates and fats in such a dietary?

(*iii*) The analysis of local food-stuffs.

(*iv*) The vitamin content of dietaries in use, especially with regard to vitamins A and D.

(*v*) The presence, if any, of diseases due to avitaminosis among the peoples on the dietaries named.

I should be grateful for any information you or your readers can give me on these lines, with regard to dietaries in use in the general population, or in hospitals and prisons in your territory.—Yours, etc.,

J. NEIL LEITCH,
Government Pathologist.

FREETOWN, SIERRA LEONE,
WEST AFRICA,
1st August, 1929.

FILARIAL LYMPHANGITIS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Colonel Acton's and Dr. Sundar Rao's paper on secondary infections in filarial lymphangitis is certainly of very great interest, but the theory that attacks of lymphangitis are due to septic infection from "focal" sepsis does not appear to rest on convincing evidence. One wonders in what proportion of cases "focal" sepsis can be found in hospital patients before it is possible to attribute lymphangitis to this factor.

To one who has lived in endemic areas of filarial disease attacks of lymphangitis without any demonstrable cause are known to be quite common in comparatively healthy young people. Filarial fever has certainly definite characteristics which do not bring it into line with septic

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Note for the Medical Profession

Selective Germicidal Power

IT is not generally recognized that antiseptics exhibit wide variations in their power of killing different bacteria. Any given antiseptic may kill one organism under certain conditions in high dilution; for another organism under similar conditions it will be found comparatively innocuous.

Phenol, the first antiseptic ever used, affords an example of this. It differentiates so markedly between the typhoid-coli group and the Gram-positive cocci that, if added in the proportion of 1 in 200 to a medium inoculated with a mixture of B. coli and streptococci, the former are killed and the latter multiply.

This poverty of action on the Gram-positive cocci—the common causes of sepsis—is characteristic not only of phenol, but of most of the powerful coal-tar antiseptics on the market, their active constituents being chemically allied to phenol.

Monsol, which is derived from a by-product of the Mond power-gas process, differs radically from other coal-tar antiseptics in its selective action. Its power of killing the Streptococcus Pyogenes is *more than* 10 *times greater than that of pure phenol or of lysol.*

Monsol is non-poisonous and non-irritant, and can be applied in effective dilution even to mucous membranes. In view of these facts, it is not surprising that Monsol has been found to have unprecedented qualities in the treatment of Streptococcal infections.

Monsol can be applied to the treatment of septic conditions of the SKIN, the MOUTH and THROAT, and the GENITO-URINARY TRACT.

Monsol
Liquid for dressings, douches, packs, and all sick-room purposes

Monsol Ointment

MONSOL
BRAND
GERMICIDE AND DISINFECTANT

Monsol Capsules
Keratin-coated for intestinal disinfection

Monsol Throat Pastilles

Obtainable of all reputable Chemists in India.
Selling Agents in India : Imperial Chemical Industries (India), Ltd.,
Calcutta, Bombay, Madras, Karachi, Rangoon, Cawnpore, Belgaum, Lahore, Ahmedabad and Cochin.
Manufacturers : The Mond Staffordshire Refining Co., Ltd., Abbey House, Westminster, London, S. W. 1.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BISEDIA

A combination of Schacht's Bismuth and Pepsina Liquida with Sedatives.

Indicated in

Acute Dyspepsia
Gastric Ulceration
Vomiting of Pregnancy
Gastric Hyperasthenia

DOSE.—One drachm in a little water just before meals.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
Bristol, England.

BISMUTHUM CRYST.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

fevers. To regard focal sepsis as the cause of these attacks is certainly bringing in a factor that has been attributed as causal to a host of conditions ranging from fibrositis to gastric ulcer. With equal justification one might incriminate constipation as a probable cause. It is recognised that these attacks are in the great majority of cases definitely due to damage of the lymphatics. It is possible that the damage may be caused by the parent worm, either by the secretion of a toxin or by lesions produced by the worm itself. It may be that the microfilariæ themselves cause injury to the lymphatics. Manson-Bahr has demonstrated that filarial orchitis is associated with the presence of a large number of microfilariæ in the tunica vaginalis. Nobody can question that attacks of lymphangitis give rise to thickening of the lymphatics and that chronic obstruction may supervene. Adult worms have even been found in filarial abscesses.

Secondary infections of the skin may possibly occur in filarial disease and are quite common in elephantiasis considering how often the skin is implicated. However, it seems to me that the real filarial fever is not in any way connected with these secondary infections, but is of the nature of an aseptic inflammation and that a distinction must be made between this and the secondary streptococcal and staphylococcal infections which are quite common in dermal lesions in the tropics.—Yours, etc.,

T. B. MENON, M.D., M.R.C.P.

44, HARRINGTON ROAD, CHETPET,
MADRAS,
15*th August*, 1929.

(*Note.*—We think that the answer to Dr. Menon's criticism will be found in the article by Lieut.-Col. H. W. Acton, I.M.S., and Dr. Sundar Rao on p. 601 of this issue, and in the editorial on p. 633.—EDITOR, *I. M. G.*)

STERILIZATION OF HYPODERMIC SYRINGE.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the query on p. 297 of your May issue, the method used by me for sterilizing syringes is described below:—

I carry a few "Soloid" examethylenetetramine (B. W. & Co.), and a spoon in my injection outfit. The needle is boiled in the spoon over the burning soloid which gives out a good heat. The boiling water is also drawn into the syringe several times. I have given a good many injections and so far have not seen any complications.

After injection the syringe and needle are cleaned with water and rectified spirit is drawn in and out twice or thrice. By this subsequent treatment with spirit I have never found a blocked needle and have therefore dispensed with the stilette.—Yours, etc.,

G. B. SINGH, L.S.M.F.,
Medical Officer,
Jaipur Lancers.

14*th August*, 1929.

A CASE OF INTOLERANCE TO QUININE.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—The following case of intolerance to quinine may be of some interest to your readers.

A Mohammedan, aged 40, came to me complaining of fever, which used to appear in the evening, general weakness and a burning sensation in the eyes. Physical examination revealed the presence of an enlarged spleen, so I suspected malaria. I proposed to administer quinine orally, but he complained that as soon as he took quinine he vomited. So I thought it better to give an injection and I injected 10 grains of quinine bi-hydrochloride, intramuscularly. Within five minutes the patient perspired and his body became quite cold. The pulse was not felt at the wrist and the patient complained of intense itching of the whole of the body. He recovered soon after I had injected digitalis and strychnine.—Yours, etc.,

RATANLAL MAGANLAL GANDHI, M.B., B.S.

RAJPIPLA,
5*th September*, 1929.

Service Notes.

APPOINTMENTS AND TRANSFERS.

IN consequence of the grant of leave to Major-General J. W. D. Megaw, C.I.E., M.B., V.H.S., I.M.S., Lieutenant-Colonel C. A. F. Hingston, C.I.E., O.B.E., I.M.S., Principal and Professor of Midwifery, Medical College, Madras is appointed to officiate temporarily as Surgeon-General with the Government of Madras, with effect from the afternoon of the 22nd August, 1929.

Lieutenant-Colonel W. M. Houston, M.B., I.M.S., Port Health Officer, Bombay, is appointed Inspector-General of Civil Hospitals, Bihar and Orissa, with effect from the afternoon of 6th August, 1929.

Major F. J. Anderson, I.M.S., on return from leave, to rejoin his permanent appointment as Principal and Professor of Surgery, Medical College, Vizagapatam.

Major J. C. Bharucha, I.M.S., to act as Superintendent, Government Royapuram Hospital and Lecturer in Surgery, Medical School, Royapuram, Madras and Medical Inspector of Emigrants, in addition to his duties, during the absence of P. F. Mathias Avargal, O.B.E., M.B.C.M., on leave.

Major K. V. Ramana Rao, I.M.S., on return from leave to rejoin his permanent appointment as District Medical Officer, Kistna, and Superintendent, Government Headquarters Hospital, Masulipatam.

The services of the undermentioned officers are placed permanently at the disposal of the Government of Madras, with effect from the dates shown against their names:—

Major N. K. Bal, M.C., I.M.S. 12th December, 1923.
Major N. M. Mehta, I.M.S. 2nd January, 1924.
Major K. V. Ramana Rao, I.M.S. 27th July, 1925.
Major T. S. Shastry, M.B., I.M.S. 1st December, 1923.

Major P. H. S. Smith, M.B., I.M.S., D.A., D.M.S. (District and Embarkation), Bombay, has been appointed to act temporarily as Health Officer of the Port of Bombay in addition to his own duties, with effect from the forenoon of 5th June, 1929.

Captain R. T. Advani, I.M.S., to officiate as Superintendent of the Ahmedabad Central Prison, *vice* Mr. W. Laxton.

LEAVE.

Major-General J. W. D. Megaw, C.I.E., M.B., V.H.S., I.M.S., Surgeon-General with the Government of Madras, is granted leave on average pay for two months and six days combined with leave on half average pay for three months and twenty-five days, with effect from the afternoon of the 22nd August, 1929.

RETIREMENTS.

Lieutenant-Colonel V. H. S. Roberts, F.R.C.S.E., I.M.S., is permitted to retire from the service, with effect from the 20th July, 1929, subject to His Majesty's approval.

Major M. Purvis, M.B., I.M.S., retires, with effect from the 6th August, 1929.

PROMOTIONS.

Major to be Lieutenant-Colonel.

Paul Knighton Gilroy, M.C., M.D., F.R.C.S. Dated 29th July, 1929.

Lieutenant (on probation) F. W. H. Caughey, I.M.S., to be Captain (provisional) (on probation), with effect from the 5th July, 1929.

Prizes at the Millbank Course.

We have been requested to publish the following list of the names of prize winners at the termination of the combined course of instruction at Aldershot and at the R. A. M. C. College, Millbank, in the last session. This batch of new recruits to both services sailed for India at the end of August, 1929. Senior officers of both services will be interested in the very considerable number of prizes now open to newly commissioned officers in both services.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Prizes.

Herbert. Highest Aggregate Marks in all Subjects.
Lieutenant H. S. Waters, I.M.S.

Parkes Memorial. Highest Marks in Hygiene.
Lieutenant D. C. Ettles, R.A.M.C.

De Chaumont. Second Highest Marks in Hygiene.
Lieutenant D. Blewitt, R.A.M.C.

Tulloch Memorial. Highest Marks in Pathology, R. A. M. C. only.
Lieutenant F. Welsh, R.A.M.C.

Fayrer Memorial. Highest Marks in Pathology, I. M. S. only.
Lieutenant H. S. Waters, I.M.S.

1st Montefiore. Highest Marks in Military Surgery.
Lieutenant D. C. Ettles, R.A.M.C.

Ranald Martin Memorial. Highest Marks in Tropical Medicine.
Lieutenant H. S. Waters, I.M.S.

2nd Montefiore. Second Highest Marks in Military Surgery.
Lieutenant H. S. Waters, I.M.S.

Marshall Webb. Highest Marks in Military Medical Administration.
Lieutenant D. Blewitt, R.A.M.C.

NOTES.

DIGIPAN.

"Digipan" is a digitalis preparation of the Temmler Chemical Works, Berlin-Johannisthal, Germany, for which it is claimed that it represents the full therapeutic activity of the leaves of *Digitalis purpurea*, and is free from the inert properties present in the crude extract. It is put up in solution for oral or hypodermic use, and in tablets for oral use. The composition is claimed to be uniform, also that there is no deterioration on keeping. The 1.1 c.c. ampoules of this preparation should interest the medical practitioner in India; it is well known that digitalis preparations are rather liable to deteriorate in the Indian climate; but in such a sealed ampoule there would appear to be no opportunity for such deterioration.

VIROL, LIMITED.

Successful Year's Working.

At the twenty-ninth annual general meeting of Virol, Ltd., Mr. Bertram S. Straus, J.P. (Chairman of the Company), presiding, the Secretary said: The gross profit is £269,707, the net profit, including the amount brought forward, is £124,096, and compares with £122,815 for the previous year. The directors recommend the payment of a dividend of 22½ per cent. on the Ordinary Shares.

The period under review has been one of continued depression in the basic industries of the country. The optimistic forecasts with regard to the revival of trade to which leading financial and industrial authorities from time to time give utterance, have not, so far, been realised, while the heavy losses arising out of the industrial upheaval in 1926 yet remain to be liquidated. In these circumstances I think we may congratulate ourselves on the satisfactory results disclosed in the balance-sheet, results which afford testimony to the popularity of our preparations and more especially to the public recognition of intrinsic merits of Virol.

In regard to the development of our new preparation Virol and Milk in powder form, you will see from the report that considerable progress has been made during the past year. The difficulty of dealing with increased trade, to which I referred at our last meeting, necessitated the erection of a new factory at Lapford, one of the richest milk districts in Devonshire.

Our Virolax preparation, one of the most valuable, from the general health point of view, that we handle, continues to meet with general support from the medical profession, as shown by the very favourable reports we are continually receiving, especially in relation to its value in constipation and intestinal toxæmia. Virolax is a unique preparation inasmuch as it combines with its laxative qualities the recognised nutrient properties of Virol.

I should now like to direct your attention to some very important results published in the *British Medical Journal* last January. The investigations in question were concerned with the large number of cases of illness in children, which manifested itself mainly as debility associated with headache, constipation, nervousness, and recurrent sickness. These published results afford striking evidence of the necessity of maintaining a correct balance of food, especially in relation to digestion of fat, and confirm in a remarkable manner the great value of our Virol formula, which admittedly achieves the necessary physiological balance of vitamin foods. Hence its great utility as a food in all such cases. This important aspect of Virol has been discussed at length with experimental evidence in a pamphlet on debility, recently issued by us to the medical profession.

PACYL.

"Pacyl" is claimed to be a derivative of cholin, a hormone normally present in the various tissues of the body, whose rôle is to maintain by stimulation of the parasympathetic the tone of such non-striated musculature as that of the gut. It is therefore especially indicated in conditions of vascular hypertension and arterio-sclerosis. Vasomotor disturbances, such as migraine, vertigo, formication, etc., are also indications for its use. The drug is manufactured by the Chemische Fabriken Dr. Joachim Wiernik & Co., Germany, and the British agents are Messrs. Coates & Cooper, 41, Great Tower Street, London, E.C. 3. It is put up in tablet form, and several reports in German medical journals speak very highly of its value; in the case of an elderly female patient of 50 years with high vascular tension, continuous administration of the drug led to a reduction of blood pressure from 210 mm. Hg. to 150 mm. in 48 days, although the dosage was steadily reduced.

This preparation may be of interest in cases of gout, anterio-sclerosis, and high blood pressure, whether of cardiac, renal or gastric origin.

Publishers' Notice.

Scientific Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to The Editor, *The Indian Medical Gazette*, c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers, relating to Subscriptions, Advertisements, and Reprints should be addressed to The Publishers, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India, Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Original Articles.

THE SIGNIFICANCE OF THE ANTIMONY TEST IN THE DIAGNOSIS OF KALA-AZAR.

PART I—SERUM TESTS.

By R. N. CHOPRA, M.A., M.D. (Cantab.),
LIEUTENANT-COLONEL, I.M.S.,
Professor of Pharmacology,
and
N. N. DE, M.B. (Cal.),
Research Assistant.
(From the Department of Pharmacology, Calcutta School of Tropical Medicine and Hygiene.)

DURING the course of an investigation on the pharmacological action of the antimony compounds, Chopra and his collaborators found that when a solution of an organic aromatic compound of antimony such as urea-stibamine was brought in contact with the serum from a kala-azar patient a heavy flocculent precipitate was produced. This precipitate was not, as a rule, produced by sera from non-kala-azar patients. This observation at once opened up the possibility of this reaction being developed into a test for the diagnosis of kala-azar. A large number of kala-azar and non-kala-azar sera were tested and three papers were published giving the results of this work. The first of these was merely a preliminary note recording the observation of the reaction on which the test was dependent. The second recorded results of the test as compared with the aldehyde test, and showed that the percentage of positive reactions with this test was somewhat higher than that with the aldehyde test. In the third paper standards of positivity were laid down, and it was shown that this test was more sensitive than the aldehyde test and appeared much earlier. The variations produced in the test during the course of treatment of the disease were also worked out in a small number of cases.

This new serum test held out a promise of being a useful adjuvant in the diagnosis of this disease. As time went on and more and more sera were tested it was found that the test was rarely positive in some non-kala-azar conditions, such as very big enlargement of spleen and liver produced by malaria, advanced tuberculosis, leucocythæmia, and in a few cases of leprosy, etc. In the meantime Dr. Napier, in charge of the Kala-azar Research at the School of Tropical Medicine, returned from leave and further work on testing the practical utility of the test was taken over by him, though the senior author's laboratory carried out all the routine examinations of sera sent by the Carmichael Hospital as well as the Medical College Hospitals, Calcutta, in order to keep the standards of positivity uniform. During this period also Chopra and Choudhury worked out the changes in kala-azar serum which gave rise to this precipitation with antimony compounds.

The precipitate formed by the interaction of the serum and urea-stibamine was colloidal in character and consisted mainly of euglobulin, possibly contaminated with traces of albumin and pseudo-globulin. Moreover the precipitation of euglobulin, by any reagent, will be maximum at its iso-electric point, i.e., at a pH of 5.5. Since the iso-electric point of euglobulin in kala-azar serum does not differ from that of the euglobulin in normal serum, it follows that euglobulin from kala-azar serum will be precipitated most at a pH of 5.5. Consequently when we mix serum and a solution of urea-stibamine (4 per cent.), the final pH of the mixture, in addition to the concentration of euglobulin and buffer action of the serum, will control the formation of any precipitation. The nearer the final pH to 5.5, the greater will be the precipitation. The pH of a 4 per cent. urea-stibamine solution is 5.2 and, therefore, at the interface, the pH will be near about 5.5, the buffer action of kala-azar serum being very weak as compared to normal serum. The concentration of euglobulin is also high. All these factors contribute towards this characteristic reaction of kala-azar serum. By dilution of the serum, this reaction would be more unequivocal, as by dilution with water, the pH of the serum is lowered, the concentration of euglobulin still remaining sufficiently high (compared to other types of sera)—to be precipitated by a strong solution of urea-stibamine. These workers have also shown that it is better to dilute the serum and use a 4 per cent. solution of urea-stibamine instead of keeping the serum intact and diluting the urea-stibamine, i.e., using a solution of the compound, less than 4 per cent. as recommended by Napier (*I. M. G.*, Vol. 61, June 1927). In fact, by diluting the serum, it was found possible to differentiate kala-azar cases from a few of the conditions, e.g., advanced malaria, tuberculosis, etc., which sometimes give a positive antimony test.

The results of Dr. Napier's investigation on the value of this test were published in the December number of the *Indian Medical Gazette* (1928). His paper contains a number of valuable criticisms of the test and the senior author considered it necessary to develop the test further, improve the technique, and reconsider the standards of positivity if necessary. We have to express our gratitude to Dr. Napier for his whole-hearted co-operation in this work. He put all the resources of his department at our disposal, supplied us with sera, and gave us access not only to his patients but to all his records.

Although the series of cases recorded by the senior author and his collaborators on which the test was originally worked out was not large, Dr. Napier has been good enough to corroborate some of their observations during his critical examinations of the test. He says that there is no doubt that the antimony test gives a greater percentage of definitely negative reactions in leprosy than does the aldehyde test. He agrees that the test is more sensitive. He also agrees that there is no doubt whatsoever that a positive result is obtainable at a much earlier stage in the disease with the antimony test than with the aldehyde test, though he does not agree that a positive or even a doubtful result can be obtained during the first few weeks of the clinical manifestations of the disease. He has also remarked that the test is not positive in every case of the disease. The changes occurring in the serum of a kala-azar patient, producing the antimony test, also occur to a lesser extent in such conditions as chronic malaria, phthisis, leprosy, etc., and this delicacy of the reaction, according to him, is a distinct

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

disadvantage. For the test to be made of clinical value he says the standards of positivity should be readjusted and the condition of the patient taken into consideration. He has even suggested that a positive diagnosis should only be made in cases in which the spleen is less than six inches below the costal margin and in which there is a strongly positive reaction. A negative diagnosis should only be made by means of this test in cases in which the serum remains quite clear, or becomes cloudy but without showing definite flocculation. With these criticisms in view we started a large series of observations the results of which are discussed below.

It is also worthy of note that because a laboratory test does not give cent. per cent. positive results, it does not follow that it has no diagnostic utility. None of the laboratory tests can claim to give absolutely positive reactions in all cases. They should be merely considered as a guide to the clinician, who should read and judge their value after full consideration of the clinical signs and symptoms of the patients. The real value of a test is the extent to which it helps and guides the physician to reach to a correct diagnosis and the ease and rapidity with which it can be performed, and this we propose to bring out in this paper. We have compared our results with the aldehyde test not for the purpose of odious comparison, but because that is the only other accepted and standard test of this kind with which results of the antimony test are comparable. The senior author in collaboration with S. G. Choudhury (1928) showed that similar factors which are responsible for the antimony test also account for the aldehyde test.

Before analysing our data, we consider it advisable to record here for the reader the revised technique of the antimony test. We have no doubt that faults in technique and want of attention to the details is responsible for the discordant results in the majority of the instances.

Serum Test.—The serum separated from the patient's blood is transferred to a miniature test tube 2½ inches to 3 inches long, made by sealing one end of a piece of glass tubing with an internal diameter of 4 to 5 mm. The transfer of serum can be easily affected by means of a capillary pipette with a rubber teat and if the serum is gradually poured along the side of the tube no air bubbles form. In a second tube serum diluted 1 in 10 with double distilled water is put in the same way. A 4 per cent. solution of urea-stibamine made up with distilled water is then slowly run down along the side of both the tubes with a capillary pipette, which must be thoroughly washed many times with distilled water. In positive cases a heavy flocculent precipitate appears almost immediately at the junction of the serum and the antimony solution in the case of whole serum, which being heavier, remains below. In case of 1 in 10 dilution of serum a heavy coarsely flocculent precipitate forms as the antimony solution permeates through the diluted serum.

From the physical character of the precipitate formed various sera can be conveniently divided into 4 groups:—

1. Strongly positive (i.e., +++). Here the precipitate forms almost immediately, is thick, and shows coarse flocculation. It conglomerates into a thick coagulated mass at the junction of the two fluids and is difficult to break even on violent shaking.

2. Positive sera (i.e., ++ or +). The precipitate is coarsely flocculent, but is not so thick as in the first group. The signs ++ or + are allotted according to the amount of precipitation produced.

3. Doubtful (i.e., ±). Under this heading we include those sera which show a precipitate or a haziness which does not show any coarse flocculation.

4. Negative (i.e., —). Here no precipitate or haziness appears, and the tube remains perfectly clear. A non-flocculent precipitate may be produced by sera from other febrile, conditions; such as enteric and diseases in which there is considerable disturbance of metabolism.

It will be noted that the precipitate formed by the 1 in 10 dilution of sera is naturally smaller in amount, and the thick conglomerated mass occurring in (1) is never produced here. There is a tendency here for the precipitate to appear as a thick white cloud as the antimony solution diffuses through the column of diluted serum. The coarsely flocculent character of the precipitate which is the chief criterion of positivity can be very clearly made out by holding the tubes against the light. When one has seen it a few times there can be no doubt about it.

The time of appearance of the precipitate after the addition of the urea-stibamine solution is another factor which is worthy of consideration. This factor is of paramount importance especially in connection with the test performed with 1 in 10 dilution of the serum. If this is not taken into consideration doubts and difficulties in the interpretation of the test might arise on this score alone. By doing a large series of both kala-azar and non-kala-azar sera and carefully noting the time of appearance of the precipitate and its maximum development, we found that although the precipitate in many cases appears immediately, the best time for the correct reading of the test was from 5 to 10 minutes after addition of the antimony solution. Readings taken within the first few minutes as well as those taken after about 20 to 30 minutes are both liable to error. In the former case a precipitate might not appear at all in a positive case, whereas in the latter case some form of haziness or even a granular looking precipitate giving the appearance of flocculation may form on standing. Incidentally this brings out the important fact that the test can be performed and the reading obtained in less than one quarter of an hour, as compared with the aldehyde test which may take as long as 24 hours.

We would like to direct the attention of readers to the above remarks as the correct interpretation

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of the test depends on the correct reading of the character of the precipitate. With kala-azar sera the precipitate shows conglomeration into a thick mass or coarse white flocculation according as to whether the whole serum or 1 in 10 dilution is used. In the majority of cases errors and discrepancies in the interpretation of the test are due to want of attention to details of the technique. We have known many cases where a test was called positive because a precipitate or even a haziness appeared, no regard having been paid to the character of the flocculation. On questioning it was found that the test was being done merely on hearsay, with a very meagre knowledge of the technique, and in some cases even the papers written by the authors of the test had not been read. If the test is performed and read as detailed in this paper the results we trust will be uniform and reliable and the reaction will prove of utility to the physician in quickly diagnosing his case.

Technical Difficulties.—When a number of sera have to be tested there are certain difficulties to be contended with which we relate below in order to help those doing the test on a large scale.

1. The miniature test tubes and the capillary pipettes used should be scrupulously clean. Just before doing the test it is advisable to wash them several times with distilled water. If this is not done, precipitate or haziness may appear which might vitiate the results. We have on many occasions been shown a so-called positive test which on thorough cleaning of the tubes and pipettes did not even show a slight haziness and remained perfectly clear.

2. The tubes should be of standard bore and we recommend those of 4 to 5 mm. internal diameter. We have selected these because the flocculation is not so clearly seen if the tubes of larger bore are used. The small tubes also have the advantage that smaller quantities of serum and urea-stibamine solution are required.

3. Locking of air bubbles in the column of the fluid should be avoided. This can be easily done by gradually pouring the fluids along the side of the tube. If an air bubble is imprisoned a fresh tube should be taken. The presence of bubbles interferes with the appearance of the precipitate and flocculation.

4. The urea-stibamine solution should be allowed to run slowly along the side of the tube, and on no account should it be violently agitated. Too much shaking of the solution changes the character of the precipitate.

5. It is preferable to use double glass-distilled water for diluting the serum; the presence of a trace of heavy metal may cause finely granular precipitation.

6. Tap water should not be used for making urea-stibamine solution or for finally cleaning the miniature test tube and pipettes. The presence of calcium and other substances in it produces a finely flocculent precipitate.

7. The serum used for the test should be quite clear. Although traces of hæmoglobin giving it a reddish tinge do not interfere with the accuracy of the results, when the serum is hazy the results cannot be depended on. Major Kernahen kept open tubes of sera for many weeks in Peshawar at room temperature during the hot weather without in any way altering the results, provided the serum was clear. He also found that the presence of traces of arsenic or mercury such as would occur in the sera of individuals receiving injections of arsenicals or mercurials in no way altered the reaction.

8. The solution of urea-stibamine required for the test should be preferably prepared in double distilled water, though ordinary distilled water gives quite good results. This solution should also be perfectly clear; if any haziness is present the solution should be discarded. A solution once prepared can be kept for a fortnight or even longer in a small bottle with a well fitting ground glass stopper.

If the test is done in a perfunctory and haphazard manner and attention is not paid to above mentioned points a certain amount of discrepancy in the reading of the tests is bound to arise. This has actually been the case. On more than one occasion it has been brought to the notice of the senior author that frank differences in the antimony test results on identical sera have occurred with two different workers, but curiously enough these differences are mostly in the domain of the "doubtful," when the physical characters of the precipitate are not clearly cut and well-defined.

SIGNIFICANCE AND VALUE OF THE TEST.

A. Undiluted Serum.

(1) *Significance of Positive Reactions.*—Kala-azar cases—early or late—generally give a positive reaction.

A perusal of Table I, horizontal columns (1) and (2) shows that of 201 definite cases of kala-azar, diagnosed by positive parasitic findings in peripheral blood culture or spleen puncture, the sera of only 5 patients gave negative results, thus indicating an error of 2.48 per cent. Strongly positive reactions indicated by +++ are usually definite cases of kala-azar, but this does not necessarily mean that ordinary positive reactions (++ or +) are not true cases of kala-azar provided typical coarse flocculation is present. In fact the majority of the early kala-azar cases give only a ++ or + reaction. We cannot, therefore, agree with the assertion that only a strongly positive reaction should be considered as indicating kala-azar. Moreover, we have noticed that there is a tendency in the minds of workers to interpret strongly positive results as "advanced cases" of the disease. Although this is true so far as the untreated cases are concerned, previous treatment with antimony compounds may modify the intensity of the reaction.

This series of patients were all from Dr. Napier's clinic and he was responsible for the parasite findings and readings of the aldehyde test. The antimony test was done in the senior-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

author's laboratory, and at the time the test was performed we had no knowledge of the clinical condition of the patient or as to whether leishmania had been detected or not. These results were obtained from Dr. Napier's records at a later date some time after the test was done, so that the factor of "natural bias" was excluded as far as possible.

TABLE I.

Comparative Results of the Aldehyde and Antimony Tests (Undiluted and Diluted Serum) in 201 cases in which diagnosis was made by finding leishmania.

	Strongly positive.	Positive.	Doubtful.	Negative.
1. Aldehyde Test.	128	40	23	10
Antimony Test.				
2. Undiluted Serum.	156	38	2	5
3. Diluted Serum (1 in 10)	109	66	13	13

A glance at this table will show that if doubtful reactions are excluded, the aldehyde test was positive in 168, or 83.58 per cent. of cases, and negative in 4.96 per cent. while the antimony test with undiluted serum shows positive results in 194, or 96.5 per cent. of cases, and negative results in 5, or 2.48 per cent. These figures bring out the value of the test in definitely positive cases of kala-azar. The percentage of doubtful and negative reactions among definite kala-azar cases is higher with the aldehyde test. We further carefully investigated the histories of those patients who gave a negative antimony test although they showed the presence of leishmania; most of them were apparently early cases of the disease. It is interesting to note here that most of these patients also gave a negative or doubtful aldehyde test. Probably similar factors were at work in both instances.

(2) *Significance of the Negative Reactions.*—A definitely negative reaction indicated by the serum remaining absolutely clear after the addition of the urea-stibamine solution is strong evidence that the serum is not from a case of kala-azar.

A group of 139 cases which were apparently not kala-azar has been analysed in Table II.

The cases in this series were admitted to the hospital during the same period as the 201 cases given in Table I. The aldehyde test in all cases was read by Dr. Napier himself and the antimony test was performed by the senior author's laboratory and in the majority of cases read by him.

TABLE II.

	Strongly positive.	Positive.	Doubtful.	Negative.
1. Aldehyde Test.	0	1*	30	108
Antimony Test.				
2. Undiluted Serum.	0	40	10	89
3 Diluted Serum (1 in 10)	0	7	7	125

* This was a treated case of kala-azar who was re-admitted for pneumonia one week after discharge.

In this table are included cases of filariasis, asthma, malaria, tuberculosis, rat-bite fever, etc., but no cultural examinations or spleen punctures were made definitely to exclude kala-azar by negative parasite findings unless there were clinical indications of the disease. It will be observed from horizontal columns (1) and (2) that in this group a large number of sera, though apparently non-kala-azar, gave a positive antimony test. As many as 35.9 per cent. of the apparently non-kala-azar sera gave a positive or doubtful reaction with the antimony test as compared with 22.3 per cent. with the aldehyde test. This is rather a high percentage and may be attributed to the greater sensitiveness of the test. We will show later how by the dilution method this source of error can be considerably minimised, but we would like to point out that this apparently high percentage may be a point in favour of the test and not against it. Napier has repeatedly drawn attention to it and the senior author realised very early in the course of this work that in an endemic area such as that in which we are working there may be cases of latent kala-azar, or even transient cases of the disease which may possibly give a positive or doubtful antimony test. In order to exclude this source of fallacy it was decided to do the test on a series of patients in a part of the country where kala-azar was not endemic. We are very grateful to Major Kernahen for doing a series in the Indian Military Hospital at Peshawar, the results of which are given in Table III. This officer came to Calcutta on one or two occasions before he undertook this work, thoroughly mastered the technique of the test, and became fully conversant with our standards.

TABLE III.

Antimony Test on 150 cases in a non-kala-azar endemic area.

	Strongly positive.	Positive	Doubtful.	Negative.
1. Undiluted Serum.	1	6	19	124
2. Diluted Serum.	0	0	2	148

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A study of horizontal column (1) of this table shows that out of a series of 150 cases, 124 gave definitely negative reactions, 19 were doubtful and 7 gave positive results. If the doubtful reactions are excluded, the error in negative diagnosis here works out at 4.6 per cent. All the sera which gave positive reactions had splenomegaly. The patient who gave a strongly positive reaction was a soldier who had served in Persia and who had an enlargement of both spleen and liver and was running a temperature. Major Kernahen thought it might be a true case of kala-azar but unfortunately the diagnosis could not be confirmed. He was the only one who gave a typical coarse flocculation such as is obtained with kala-azar sera. This shows that in a small percentage of cases in a non-endemic area where there is practically no possibility of kala-azar existing, 4.6 per cent. do give a positive antimony test with undiluted serum as compared with 28.7 per cent. in an endemic area. This might favour the suggestion of latent or fleeting kala-azar being the cause of the high incidence in an endemic area. It will be shown later how by the dilution method the percentage of positives in apparently non-kala-azar cases can be further reduced.

(3) *Significance of the Test in clinically diagnosed Kala-azar.*—We now return to another class of case which we collected from among the patients of the Medical College Hospitals. In this group, although the diagnosis could not be confirmed by positive parasitic findings, all the clinical symptoms as well as other laboratory findings such as leucocyte count, etc., left little room for doubt that they were cases of kala-azar. Besides, these cases reacted to the antimony treatment in the same way as the kala-azar patients do. This group may not be of importance to those who have all the facilities of well equipped laboratories which can carry out cultural and other examinations for the detection of the parasites, but as this is the usual standard of diagnosis which is attained by medical men in general practice and in the outpatient department of big hospitals, we have no hesitation in presenting the following table. Both the antimony test and the aldehyde test were performed by us and we tried to adhere to the rigid standards of positivity laid down by Dr. Napier.

TABLE IV.

Antimony and Aldehyde Test in 128 clinically diagnosed Cases of Kala-azar.

	Strongly positive.	Positive.	Doubtful.	Negative.
1. Aldehyde Test.	80	25	19	4
Antimony Test.				
2. Undiluted Serum	93	34	1	—
3. Diluted Serum (1 in 10)	43	62	15	8

Table IV, horizontal columns (1) and (2), gives the results of antimony and aldehyde tests in 128 patients collected from the Medical College Hospitals, where diagnosis was made from clinical symptoms and laboratory findings other than actual finding of the parasites. It will be observed that whereas with the aldehyde test 105, or 80.4 per cent., gave a positive reaction, with the antimony test 127, or 99.2 per cent., were positive. This series may not be important from the scientific point of view, but it brings out the utility of the test from the point of view of the general practitioner who wishes to confirm his clinical findings with such laboratory tests as are easily available to him. All these patients were treated as cases of kala-azar with antimony injections and progressed favourably.

Summary of Positive and Negative Findings in Kala-azar and Non-kala-azar.

Antimony Test (Undiluted Serum Method).

TABLE V.

Results.	Reading.	Definite kala-azar cases.	Non-kala-azar cases.
Positive ..	+++ ++ +	194	40
Doubtful ..	±	2	10
Negative ..	—	5	89
		Kala-azar cases 201 diagnosed by finding parasites.	Control 139 non-kala-azar cases.

Correct diagnosis in 194+89=283 cases out of 340, or 83·2 per cent.
Doubtful diagnosis in 2+10=12 cases out of 340, or 3·6 per cent.
Wrong diagnosis in 40+5=45 cases out of 340, or 13·2 per cent.

TABLE VI.

Aldehyde Test.

Results.	Reading.	Definite kala-azar cases.	Non kala-azar cases.
Positive ..	+++	168	1
Doubtful ..	(+) or ±	23	30
Negative ..	(—) or —	10	108
		201	139
		Kala-azar diagnosed by parasite findings.	Control non-kala-azar cases.

Correct diagnosis in 168 + 108 = 276, or 81·2 per cent.
Doubtful diagnosis in 30 + 23 = 53, or 15·6 per cent.
Wrong diagnosis in 10 + 1 = 11, or 3·2 per cent.

Summarising the comparative results given by the two tests in the two groups of definitely kala-azar and apparently non-kala-azar cases, it will be seen that in case of the antimony test, a correct diagnosis can be made in 283 cases out of 340, i.e., in 83.2 per cent., a doubtful diagnosis in 12 cases, i.e., 3.6 per cent., and a wrong diagnosis in 45 cases, i.e., 13.2 per cent. In case of the aldehyde test a correct diagnosis can be in 276 cases;

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

or in 81.1 per cent., a doubtful diagnosis in 53 cases, or 15.6 per cent., and a wrong diagnosis in 11 cases, or 3.2 per cent. of cases. Wrong and doubtful diagnosis in the case of the antimony test works out at 16.8 per cent., as compared to 18.8 in cases of the aldehyde test.

DILUTED SERUM METHOD.

We have seen in Table II that 35.9 per cent. of apparently non-kala-azar cases in an endemic area gave a positive antimony test. Owing to the greater sensitiveness of the test a positive reaction is obtained in chronic malaria with enlargement of the spleen and a few other conditions. It was with a view to eliminating these that we introduced the 1 in 10 dilution method. We will see what bearing the application of this method has on the results.

We have to return to Table I, horizontal column (3), which shows that the diluted serum method gives 175, or 87.06 per cent., definitely positive results as compared with 194, or 96.5 per cent., with undiluted serum; the doubtful reactions were 6.4 per cent. as compared with 1.0 per cent., and negative results were obtained in 6.4 per cent. as compared with 2.5 per cent. The doubtful and negative reactions in this series where kala-azar was definitely proven by parasitic findings, is 33 in the case of the aldehyde test, 7 in the case of the undiluted serum test and 26 in case of diluted serum test. This shows that the value of the positive diluted serum test in kala-azar sera is not so great as the undiluted serum test, but even so is slightly higher than the aldehyde test. There are a larger number of doubtful and negative reactions owing to the fact that in all probability the proteins responsible for the reaction are not present in sufficiently large quantities to give a positive test in 1 in 10 dilutions in some of the early cases.

A perusal of Table II, horizontal column (3), shows the value of the dilution test in 139 patients who were not apparently kala-azar. It will be seen that whereas with the undiluted serum test only 89 negatives were obtained, with the diluted serum method a definite negative diagnosis could be made in 125, or nearly 89.9 per cent. The percentage of wrong and doubtful diagnosis in this series with the aldehyde test was 22.3 per cent.; with the undiluted antimony test it was 35.9 per cent.; and in case of the diluted serum test is only 10.0 per cent.

When the dilution test was performed in a non-endemic area even better results were obtained.

A perusal of Table II, horizontal column (2), shows that the dilution test was entirely negative in 148 cases out of 150, i.e., in 98.7 per cent., the error of positive diagnosis being only 1.3 per cent. in non-kala-azar cases in a non-endemic area.

Table IV, horizontal column (3), gives the results of 128 cases of kala-azar diagnosed by clinical and laboratory findings but in which no effort was made to find leishmania.

It will be observed that 105 cases, or 82 per cent. gave a positive result with the aldehyde test, 127 or 99.2 per cent., gave a positive result with the undiluted serum method, and 105, or 82 per cent., with the diluted serum method. In these cases the result of the dilution method runs parallel with the aldehyde test and if it can be claimed for the latter test that "for all practical purposes a positive reaction in an untreated case indicates kala-azar" the same claim can be put forward for the dilution method.

Summary of Antimony Test Result (Dilution Method).

TABLE VII.

Results.	Reading.	Definite kala-azar cases.	Non kala-azar cases.
Positive ..	+++ ++ +	175	7
Doubtful ..	±	13	7
Negative ..	−	13	125
		201	139

	Aldehyde test from Table VI.
Correct diagnosis in 175 + 125 = 300 or 88·2 per cent. ..	81·2 per cent
Doubtful diagnosis in 13 + 7 = 20, or 5·9 per cent ..	15·6 per cent.
Wrong diagnosis in 13 + 7 = 20, or 5·9 per cent. ..	3·2 per cent.

It will be observed that the percentage of correct diagnoses is greater than with the aldehyde test.

The Time of Appearance of the Antimony Test and its relation to Splenic Enlargement.

The time of appearance of the antimony test in the course of the disease is difficult to decide satisfactorily, as histories in most cases are unreliable and it is impossible to say at what stage of the disease patients come under treatment. Through the kindness of Dr. B. M. Das Gupta, Assistant Professor of Protozoology, we have been able to collect a series of 11 cases which were, according to him, very early cases of kala-azar. They were all his private cases, gave a history of fever of short duration, and the fact that the spleen in almost all these patients was only just palpable and well above the costal margin, showed that probably the duration of fever was not more than a month or two at the most. The final diagnosis in all these cases was made by finding the leishmania in cultures or by puncture.

A perusal of Table VIII shows that the antimony test was positive in all the eleven cases with the undiluted serum, and with 1 in 10 dilution was negative in 1 and doubtful in 2 cases. In such cases the aldehyde test is usually negative or doubtful. Although the series of cases is very small it does show that the antimony test appears at an early stage, probably within the first month or two. More work, however, is necessary on this point.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE VIII.

Case No.	Spleen index.	Blood culture.	Spleen puncture.	Antimony test.	
				Undiluted.	Diluted (1 in 10)
1.	Palpable	+	Not done	+ +	+
2.	Palpable on deep inspiration.	Not done	+	+	±
3.	Palpable . ..	+	Not done	+ +	+ +
4	Palpable .. .	Not done	+	+ +	+ +
5.	Palpable .. .	Not done	L.D. bodies on splenic pulp culture.	+	+
6.	Palpable	+	Not done	+ +	+
7.	½″ below costal ..	Not done	+	+	+
8.	Palpable	+	Not done	+	−
9.	½″ below costal arch ..	+	Not done	+	±
10.	Not noted	+	Not done	+	−
11.	Not noted.. ..	+	Not done	+	±

As regards the relationship between the antimony test and the size of the spleen, we have only been able to study its bearing on positive cases of kala-azar. Our experience is that the size of the spleen makes no difference to the diagnostic value of the test in these cases. The difficulty arises in differentiation of those cases of malaria with chronic enlargement of the spleen which give a positive antimony whole serum test. These can be usually differentiated by doing the 1 in 10 dilution test, but not infrequently there are border line cases in which nothing short of a spleen or liver puncture or blood culture will decide the diagnosis. Major Kernahen who did 50 cases of chronic malaria with enlargement of the spleen in Rawalpindi, which is a non-endemic area, informed us that the dilution test was practically never positive in chronic malaria. We are doing more work in this connection and we hope to bring out the relationship between the size of the spleen and the antimony test in non-kala-azar cases in an endemic and a non-endemic kala-azar area, and the results will be communicated in due course.

A perusal of the figures given in the tables incorporated in this paper will give the reader an idea of the diagnostic value of the antimony test. It is true that the series of cases given is not very large. This is due to the fact that we confined ourselves to patients who visited the out-patient department of the School or were actually admitted to the Carmichael Hospital for Tropical Diseases within a fixed period. These results are, however, typical of the test and our experience with a large number of patients shows that they are constant within reasonable limits.

SUMMARY AND CONCLUSIONS.

(1) The technique of the antimony test and the standards of positivity have been fully described. Although the precipitate in the majority of cases appears immediately, it has been shown that the best time for the reading of the test is from 5 to 10 minutes after the addition of antimony solution to the serum. This is especially the case with the diluted serum test; readings taken within the first few minutes as well as those taken after 20 to 30 minutes are both liable to error. In the former case a precipitate may not appear at all in a positive case, whereas in the latter case some form of haziness or even a granular looking precipitate giving the appearance of flocculation may be formed on standing in a negative case.

(2) The correct interpretation of the test depends on the correct reading of the character of the precipitate. With kala-azar sera the precipitate usually shows conglomeration into a thick mass with the undiluted serum, and coarse white flocculation with the diluted serum.

(3) The miniature tubes and the pipette, etc., used for performing the test should be scrupulously clean, and before the test is done it is advisable to wash them with distilled water. The tubes should be of standard size and we recommend those with 4 to 5 mm. internal diameter. The urea-stibamine solution should be prepared in distilled water. If these precautions are not taken a haziness or even a precipitate may appear with non-kala-azar sera.

(4) It is advisable to do the test with both the undiluted and diluted serum (1 in 10) in all cases. With a little practice the dilution can be easily made and the test can be performed by the patient's bed-side.

(5) Strongly positive reactions (i.e., +++) are usually definite cases of kala-azar, but this does not mean that ordinary positives (i.e., ++ and +) are not true cases of the disease. In fact the majority of the early cases of kala-azar give a ++ or + reaction.

(6) In 201 cases of kala-azar in which a diagnosis was made by the finding of leishmania a positive reaction was obtained in 96.5 per cent. of cases with the undiluted serum, as compared with 83.5 per cent. of aldehyde test. With the diluted serum this percentage was reduced to 87.0 because proteins responsible for producing the reaction were insufficient in some of the early cases.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(7) In a series of 139 non-kala-azar cases in which, however, the diagnosis was made clinically in the majority of cases without looking for leishmania, the antimony test was definitely negative in 64.1 per cent. as compared with 77.7 per cent. of the aldehyde test. The high percentage of positives in apparently non-kala-azar cases is due to the greater sensitiveness of the test. It is admitted that in a kala-azar endemic area from which these cases were obtained, there may be patients suffering from fleeting or latent kala-azar which have been missed by the aldehyde test and were caught by the antimony test. This is borne out by the fact that in a series of 150 cases done in a non-endemic kala-azar area (Peshawar) the percentage of definitely negative reactions with undiluted serum was increased to 86.6 per cent.

(8) With the diluted serum the source of error in non-kala-azar cases can be greatly reduced. Owing to the greater sensitiveness of the test, a positive reaction is sometimes obtained in very chronic cases of malaria with enlargement of spleen, advanced tuberculosis, leucocythæmia, etc.; such cases do not as a rule give a precipitate in 1 in 10 dilution. With the dilution method 89.9 per cent. of cases gave a definitely negative reaction in the above mentioned series of 139 non-kala-azar cases from an endemic area. When the dilution method was done in 150 cases in a non-endemic area the percentage of negatives went up to 98.7.

(9) In a series of 128 cases of kala-azar diagnosed by clinical symptoms, leucocyte counts and the therapeutic test of recovery after treatment with antimony compounds, etc., the antimony test was positive in 99.2 per cent. as compared with 80.4 per cent. by the aldehyde test.

(10) Taking kala-azar and non-kala-azar cases together in a series of 340 cases, correct diagnosis could be obtained with the aldehyde test in 81.2 per cent. of cases, with the undiluted antimony test in 83.2 per cent. and with the dilution method in 88.2 per cent. This brings out the advantage of doing the test both with undiluted and diluted serum.

(11) The size of the spleen does not in any way affect the diagnostic value of the test in definite kala-azar cases. The antimony test has been shown to be positive in early cases of kala-azar with a hardly palpable spleen when the aldehyde test is negative, as well as in those with a spleen over 6 inches below the costal margin.

(12) By means of the antimony test a diagnosis can be made in the majority of cases of kala-azar met with in the outpatient departments of dispensaries and hospitals in the same way as with the aldehyde test.

(13) The test is somewhat more sensitive than the aldehyde test and appears earlier in the course of the disease. The dilution method enables us to exclude a large majority of non-kala-azar cases and therefore it is possible to make a negative diagnosis in a large number of cases.

(14) The antimony test can be performed and read in less than one quarter of an hour. For the completion of the aldehyde test it may be necessary to wait for 24 hours.

In conclusion it may be said that the antimony test is a rapid and efficient method of diagnosing kala-azar. A positive reaction is as a rule obtained with undiluted sera of almost all cases of the disease. If the serum is diluted ten times, kala-azar sera give a characteristic coarse flocculent white precipitate; non-kala-azar sera rarely give a similar precipitate. With undiluted sera almost all the early and advanced kala-azar cases will give a positive reaction, but a few of the chronic malarias, advanced tuberculosis, leucocythæmia, etc., may also come in. When 1 in 10 dilutions are used some of the very early cases of kala-azar may be negative, but the non-kala-azar conditions named (which give a positive test with whole serum) will be excluded. If the test is done with both the undiluted and diluted sera a more or less certain diagnosis can be obtained in a very large majority of cases, especially if the results are interpreted with due regard to the clinical condition of the patient. A very small class of difficult and border line cases will be left, in which a definite diagnosis cannot be made except by spleen or liver puncture or cultural examinations.

REFERENCES.

(1) Bhattacharya, Pasupati (1928). Antimony Test in early diagnosis of Kala-azar. *Ind. Med. Gaz.*, Vol. LXIII, pp. 123—126, March.

(2) Bose, A. N., Ghose Dastidar, S. K., and Bagchi, B. N. (1928). Observations on the Antimony Test for Kala-azar. *Ind. Med. Gaz.*, Vol. LXIII, pp. 370—372, July.

(3) Chopra, R. N. (1927). An Experimental Investigation into the action of organic compounds of Antimony. *Ind. Jour. Med. Res.*, Vol. XV, No. 2, July.

(4) Chopra, R. N., Gupta, J. C., and David, J. C. (1927). A preliminary note on the action of antimony compounds on the blood serum. A new serum test for kala-azar. *Ind. Med. Gaz.*, Vol. LXII, No. 6.

(5) Chopra, R. N., Gupta, J. C., and Basu, N. K. (1927). Further observations on the serum test for kala-azar with organic antimony compounds. *Ind. Med. Gaz.*, Vol. LXII, No. 8, August.

(6) Chopra, R. N., Gupta, J. C., and Basu, N. K. (1927). The Antimony Test in the Diagnosis of Kala-azar. *Ind. Med. Gaz.*, Vol. LXII, No. 12, December.

(7) Chopra, R. N., and Choudhury, S. G. (1928). Studies in the physical properties of different blood sera. Part I. Iso-electric points of blood sera and their significance in the antimony test for kala-azar. *Ind. Jour. Med. Res.*, Vol. XV, No. 4, April.

(8) Chopra, R. N., and Choudhury, S. G. (1929). On the causation of Formol-gel reaction in Kala-azar. Part I. *Ind. Jour. Med. Res.*, Vol. XVI, No. 4, April.

(9) Director, Calcutta School of Tropical Medicine (1928). *Annual Report of the Calcutta School of Tropical Medicine.*

(10) Napier, L. E. (1927). A new serological test for kala-azar. *Ind. Med. Gaz.*, Vol. LXII, No. 7.

(11) Napier, L. E. (1928). A critical examination of the Antimony Test for Kala-azar. *Ind. Med. Gaz.*, Vol. LXIII, No. 12, December.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

NOTES ON "THE SIGNIFICANCE OF THE ANTIMONY TEST IN THE DIAGNOSIS OF KALA-AZAR."

By L. EVERARD NAPIER, M.R.C.S., L.R.C.P.,
Kala-azar Research Worker (Indian Tea Association), Calcutta School of Tropical Medicine and Hygiene.

A YEAR ago the writer of these notes published a paper entitled "A Critical Examination of the Antimony Test for Kala-azar." This paper was an analysis of the results of the antimony tests and the aldehyde test in 165 cases in which a definite diagnosis had been made by demonstrating the presence, or the absence, of the parasite by means of a spleen or liver puncture. One hundred were cases of kala-azar and 65 were patients who had come under suspicion as cases of kala-azar, but who had subsequently been shown not to be suffering from the disease. Thus the 65 non-leishmania patients were not a true sample of the "hospital population," nor even of the "fever population," but were selected controls who were suffering from a condition clinically identical with kala-azar, or whose blood had undergone some of the protein changes associated with that disease (i.e., their aldehyde reaction was "doubtful"). It is not surprising therefore that the results of all the serum tests did not appear to be altogether satisfactory: they are summarized in the table below:—

	Aldehyde.	Antimony, undiluted serum.	Antimony, diluted serum.
Correct ..	49.4	62.8	63.4
Incorrect ..	5.5	23.8	14.0
Doubtful ..	45.1	13.4	22.6
Proportion of correct to incorrect (to nearest whole figure).	9 to 1	3 to 1	5 to 1

To take just one figure in the table of the first series, it will be seen that for the antimony test with undiluted serum the proportion of correct to incorrect results was 3 to 1; this figure is so low that it suggests that the test is not of much practical value. By taking into consideration the size of the spleen and readjusting the standards of positivity it was found possible to raise the proportion to 12 to 1, i.e., 28.6 correct to 2.4 incorrect diagnosis, but this meant a considerable curtailment of the utility of the test, as there remained a very large group of "doubtful" results. Anyone who knew the extreme difficulty of making a diagnosis in this class of cases, except by the finding of the parasite, would realise that this is a comparatively satisfactory result, but judged by ordinary standards it does not appear satisfactory, and it seems possible that this paper may have prejudiced the inexperienced against the test. For this reason the writer promised Col. Chopra his assistance in carrying out another series of tests on definitely diagnosed cases of kala-azar with the general hospital population as the controls. The results of this series have been reported above by Col. Chopra and Dr. De; at their suggestion these notes have been written by way of comment on their interpretation of the results.

In the previous series all the results were read by Col. Chopra, but in this series the whole test was carried out in his laboratory. Previous experience had shown that some slight modification in the technique—mainly with reference to the time after addition of the serum at which the results should be read—was advisable. The modifications undoubtedly improve the tests—especially the test with diluted serum—but the very marked apparent improvement is due mainly to the fact that the controls were an entirely different class of patient in this series.

The figures for the present series can be summarized as follows:—

	Aldehyde.	Antimony, undiluted serum.	Antimony, diluted serum.
Correct ..	81.2	83.2	88.2
Incorrect ..	3.2	13.2	5.9
Doubtful ..	15.6	3.6	5.9
Proportion of correct to incorrect (to nearest whole figure).	25 to 1	6 to 1	15 to 1

The ideal test would be one in which there were no "doubtful" results and in which all the results were correct. The shortcomings of a test can be measured in two ways, by the number of "doubtful" results and by the proportion between the correct and incorrect results. Though figures can be given for these two factors they are not comparable; in certain circumstances it may be advantageous to obtain a diagnosis in only 50 per cent. of cases provided the diagnosis is accurate, whereas in others it may be better to make a definite diagnosis in 100 per cent. of cases, even if this diagnosis is correct only four out of five times. In hospital practice where other methods of diagnosis are available—e.g., spleen puncture and blood culture—it is not a serious matter if, as in the case of the aldehyde test in this series, there are 15.6 per cent. "doubtful" results, provided 25 *out of* 26 of the definite (i.e., positive or negative) results are correct; whereas in mofussil dispensary practice, when other means of diagnosis are not available, in order to obtain a definite diagnosis in a higher proportion of cases it is possibly better to make some sacrifice of accuracy and to use the antimony test with diluted serum with which a definite diagnosis can be made in 93.5 per cent. of cases, but in which the number of correct definite results is reduced to 15 in each 16 cases. It is, however, doubtful if under any circumstances it would be justifiable to use the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

undiluted serum antimony test and reduce the proportion of correct to incorrect results to 6 to 1 for the purpose of obtaining a further slight increase in the number of definite results.

Col. Chopra has shown that in a non-endemic area the antimony test is seldom positive. This is also true of the aldehyde test. Gaté and Papacosta (1920) tested the serum of some 400 persons in Europe by the same technique and in no case did they report that opacity of the serum occurred; also Lal (1923) after testing a number of cases of chronic malaria in the Punjab concluded that "The aldehyde test as used by Napier is not positive in malaria if the standards of this author be taken."

Col. Chopra has argued that the rarity of these false positives in non-endemic areas suggests that many of the controls in this series may have been cases of "latent or transient" kala-azar. This, in the writer's opinion, is extremely unlikely. They were all patients in the Carmichael Hospital for Tropical Diseases and whenever there was a suggestion that they might be suffering from kala-azar the present writer was asked to see them; a spleen or liver puncture was done in most instances and in 17 cases a spleen puncture culture was done and was "negative"; the serum test results in these 17 cases can be summarized as follows:—

	Positive.	Doubtful.	Negative.
Aldehyde test ..	0	12	5
Antimony test, undiluted serum.	13	2	2
Antimony test, diluted serum.	4	3	10

Furthermore, in the writer's experience the serum tests are always entirely negative in the transient case; when the serum changes develop, the disease becomes progressive until checked by treatment, or by some severe disturbance, such as an attack of pneumonia.

On the other hand, the presence of a disproportionately large number of "false positives" in the endemic area requires accounting for and a possible explanation is that many of the patients in which these occur have at some time or another had kala-azar. The practical point, however, is that at the time they are not suffering from a generalized leishmania infection and from experience with such cases one knows that the clinical condition is not improved by antimony treatment.

The observations with the test in cases of kala-azar diagnosed by other methods than finding the parasite do not add any evidence in favour of the test, because probably in most instances the diagnosis was made on the result of the test itself.

CONCLUSIONS.

It is difficult to compare the two tests, the antimony and the aldehyde, as each shows individual qualities and individual defects. The aldehyde test's main defect lies in the fact that it gives a large number of "doubtful" reactions, 53 (or 15.6 per cent.) in this series, and that the reaction is negative in many early cases, in 10 in this series. Its advantage lies in the fact that for all practical purposes a positive result means that the patient is suffering from kala-azar—of the 169 positive results of this series 168 were in patients actually with kala-azar and the other was in a patient who had completed a course of treatment and had only been discharged one week before he was readmitted with pneumonia, that is, he was a convalescent kala-azar case.

The antimony test with undiluted serum has the advantage of being positive more frequently than the aldehyde test in early cases, but nevertheless it was entirely negative in 5 cases of kala-azar in this series. A strongly positive result appears to be diagnostic of kala-azar, but a positive, i.e., ++ or +, result has little significance as more than half the cases in this series in which it occurred were not kala-azar.

The antimony test with diluted serum has the advantage of giving a definite result in a large number of cases, 93.5 per cent. in this series, but at the same time the results are less satisfactory than the aldehyde test results at both ends of the scale; 7 of the negative controls gave a positive, i.e., ++ or +, result, and 13 of the kala-azar cases gave a negative result, whereas for the aldehyde test the figures were 1 and 10, respectively.

As a final conclusion, the present writer considers that Col. Chopra and Dr. De's figures show that the aldehyde test and the antimony test with diluted serum are tests of almost equal and very considerable practical value in the diagnosis of kala-azar, but that the antimony test with undiluted serum falls short of both these tests in this respect.

My thanks are due to Col. Chopra and Dr. De for permitting me to see, not only the text of their paper, but all their laboratory records, and for allowing me this opportunity of submitting these conclusions on their observations.

REFERENCES.

Gaté and Papacosta (1920). Une nouvelle réaction des sérums syphilitiques formol-gélification. *Comptes Rendus de la Soc. de Biol.*, Séance du 20 Novembre, p. 1432.

Lal, R. B. (1923). The "Aldehyde Test" in Malaria. *Ind. Med. Gaz.*, LVIII, p. 369.

T. A. B. VACCINE IN RELATION TO AN OUTBREAK OF ENTERIC FEVERS.

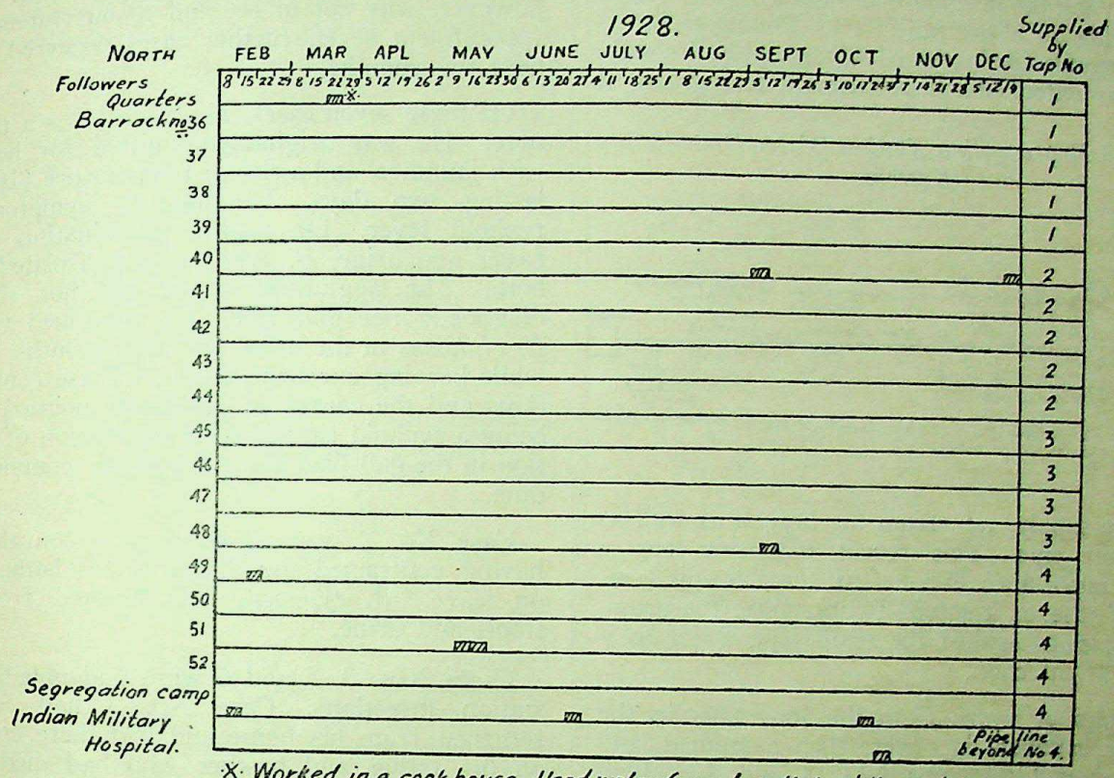
By M. K. AFRIDI, M.B., CH.B. (St. And.),
D.T.M. & H. (Lond.),
CAPTAIN, I.M.S.,
Quetta.

THE introduction of T. A. B. inoculation in the Army, while its undoubted value is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

recognized, has produced two definite complicating effects in that it has made the study of diagnosis and epidemics decidedly more difficult. The uncertainties of a diagnostician are too well known to elaborate, and it is now becoming clear that the isolation of the causative organism is the only definite and early laboratory help in diagnosis.



X. Worked in a cook house. Used water from tap No 4 while on duty.
SPOT MAP of Barracks showing (I) Distribution of cases.
(II) Water supply.

The Widal reaction, which used to be such an effective factor, has ceased to hold its former position; the agglutinin curve takes at least two weeks to work out and requires repeated samples of blood which may be justifiably objected to by the patient. A certain officer had *B. paratyphosus A* infection and his wife was aghast at the number of times her husband was "bled." I am sure she laid the usual charge of callousness at the door of the medical profession.

To illustrate the rôle of T. A. B. vaccine in altering the course of an epidemic I will describe an outbreak of the enteric group of fevers in a protected community.

Commencing from February 1928, a number of cases occurred in a training battalion. Neither the situation of the affected barracks, nor the order of occurrence of the disease pointed to any of the classical vehicles of infection. The cases kept on appearing in a sporadic manner and made the problem of their source of origin a very puzzling one indeed.

The investigations carried out, with negative results, included repeated examination of the food handlers and the bacteriological analysis of milk. In addition, the food handlers were reclassified according to their arrival in the station and association with cases. Two bhisties, recently enrolled and related to five cases, were each examined on six consecutive days and found "non-carriers." The possibility of a "carrier" or "carriers" amongst the men themselves was kept in mind, but no relationship was traceable to any individual. The outbreak was not influenced by the "fly seasons."

At no time was water ignored as a possible source of infection, and in the early stage all the available evidence was against its involvement. Thus the rest of the garrison remained unaffected throughout this period, and in the training battalion itself no cases occurred in 11 out of 17 barracks; also, the routine examination of the water supply from a tap in the British Military Hospital had been giving constantly satisfactory results.

On reviewing the situation in November 1928 when the cases had totalled 10, the fact that the affected individuals belonged to different castes, different religions, and different cookhouses; and secondly, that one man contracted the disease whilst in the Indian Military Hospital for a surgicial condition, made the further detailed investigation of water supply essential.

Water Supply.—Water is centrally chlorinated in a tank situated about two miles to the north of the affected lines. Distribution is by pipe line. The main pipe runs by the British Military Hospital, through the British infantry and artillery

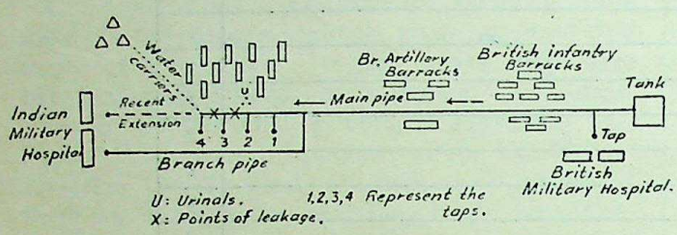
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

lines, along the training battalion barracks and terminates in the Indian Military Hospital, the most southerly situated unit in the station. The supply to the training battalion comes from four stand pipes on the main line.

Prior to August 1928 the main pipe terminated at the furthermost tap marked 4 in the diagram and the hospital was supplied by a branch line taking off above tap No. 1. Owing to incessant demands for increased water supply the main pipe was extended to the hospital, thus giving it

Diagram Representing Station Water Distribution System.



a double supply, viz., from the branch as well as the main pipe. This recent extension has a special importance in view of the "hospital infected" case, as it served to crystallize the growing suspicions against the main pipe water as a source of infection.

Samples of water from the four taps in the training battalion lines were then examined, and it was found that taps Nos. 3 and 4 yielded definitely contaminated water; tap No. 2 was slightly contaminated; while a sample from tap No. 1 was sterile. These tests were repeated, and although the results did not wholly corroborate the first findings, it was evident that the taps Nos. 4 and 3 yielded definitely contaminated water, and that the water from taps Nos. 2 and 1 had slight contamination only. The conclusion drawn was that there was a leakage in main line somewhere below tap No. 1.

The reluctance of the M. E. S. to agree to expose the line on such evidence had an element of justification. It was, however, ultimately agreed to, and the pipe was found to have a freely leaking joint below tap No. 3, and a smaller leakage below and close to tap No. 2. The Garrison Engineer was of opinion that this condition of the pipe was of old standing.

The proximity of the urinals to the points of leakage has special significance in this connection (*vide* diagram).

The water supply is intermittent, and the flow of water influencing the spread of contamination up and down the pipe would account for the discrepancy shown in the results of the analysis from taps Nos. 1 and 2. It would, however, be expected that the contamination would tend to concentrate more in taps Nos. 3 and 4 which supply the southern barracks and the segregation camp where most of the cases occurred.

The repairs were completed in the first week of December, and after case No. 11—presumably infected before the repairs—no more cases occurred for a month and a half. The water samples from the taps gave satisfactory results, and we thought we had seen the last of the disease. This, however, was not to be, and to our intense disappointment seven further cases occurred in the next two months.

Of these seven cases, No. 1 deserves a passing note. He was originally admitted for hepatitis with jaundice, and a rise of temperature (100°F.) lasting two days. He had no symptoms of typhoid fever. On routine examination of the fæces and urine, *B. typhosus* was isolated from both. The agglutinin curve did not show a diagnostic rise and fall. He continued to pass *B. typhosus* in the urine for three months, all the while keeping excellent health. These considerations and the course of his illness pointed to his being a typhoid carrier with localization of infection in the gall bladder and possibly common bile duct.

Case No. 2 was admitted as a convalescent, having contracted the illness at his home when on leave. *B. typhosus* was isolated from his stools and urine.

Cases Nos. 3, 5 and 6 were undoubtedly outstation infections. Case No. 3 had recently returned from his home and had there attended on his father and brother who had died from typhoid fever.

On the other hand, Cases Nos. 4 and 7 were infected in the station. They belonged to the same company and barrack room, and in their case the infection was traceable to their cook, who was found to be a "carrier" of *B. typhosus*. This cook had attended the hospital for two days in December 1928 for colic and slight temperature. It is probable that he had then a very mild form of typhoid fever, as a recent carrier examination in September 1928 had given negative results.

Water was thus found to be free from being a source of infection in the second series of cases.

There have been no further cases to date.

General Remarks.—This investigation has been given in full to bring out the fact that although the source of infection was a commonly recognized one, the tendency for the outbreak was to lose its classical features. The explosive character and the uniform distribution of a water-borne infection were conspicuously absent. The immunity factor which is always an "unknown quantity" in the study of an epidemic, is rendered still more "unknown" by prophylactic inoculation. This results in an irregular and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

wider dispersal of the "susceptibles" who eventually develop the disease, when they receive a massive dose of infection. That in my opinion can be one explanation of the peculiar behaviour of the outbreak.

Another point worthy of notice is the degree of protection afforded by the T. A. B. inoculation. Excluding the barracks supplied by tap No. 1, there were roughly 500 men exposed to infection for a period of one year, and if allowance is made for the fact that a training battalion has a complete "turn over" of personnel every nine months, this figure would come to be nearer 1,000. Out of these 11 men contracted the disease with a case incidence ratio of only 2.2 per cent.

It is also apparent that the protection is not absolute, and it is only in the combination of T. A. B. inoculation and good sanitation that we possess a powerful and effective weapon against the onslaught of this disease.

A SIMPLE METHOD OF STANDARDIZING THE RED CELL SUSPENSION IN CONNECTION WITH THE WASSERMANN REACTION.

By S. D. S. GREVAL, B.SC., M.D., D.P.H.,
CAPTAIN, I.M.S.,
Assistant Director, Pasteur Institute of Burma, Rangoon.

RED cells collected and washed apparently under identical conditions may not yield a deposit of the same density. A 5 per cent. or 3 per cent. suspension made from the deposit will consequently differ from day to day. The minimum hæmolytic dose of the complement obtained therefore is not comparable on different days. Besides, with a suspension thicker than usual an M. H. D. is obtained which is in excess of what is normally destroyed by an anticomplementary antigen.

Attention appears to have drawn to this important adjustment of the hæmolytic system long ago(1). In the usual works of reference and publications in English, however, one does not find any details.

The writer finds that the density of the suspension, for the requirements of method IV of the British Medical Research Council(2), is optimum when 7 drops of a 6 per cent. suspension delivered from a Wright's pipette, with the point fitting hole No. 58 of the standard wire gauge, giving a direct reading of 51 on Sahli's scale. Such drops measure 0.02 c.c. each.

A suspension giving a higher reading can be adjusted to give the required figure by dilution.

Example:—A suspension gives a reading of 62, total volume is 100 c.c.

$$51 : 62 :: 100 : X \therefore X = \frac{62 \times 100}{51} = 121.56$$
$$= 121.6 \text{ approx.}$$

An increase of volume to 121.6 c.c. will reduce the reading to 51.

A suspension giving a lower reading can be made to give a higher reading by the addition of more of the deposit and then adjusted as detailed above.

Since adopting this method of standardizing the red cell suspension, the writer has always found a perfect correspondence between the two rows of tubes used in determining the M. H. D. of the complement, when titrated with and without the presence of antigen. This fact, incidentally, emphasizes the importance of determining the M. H. D. of the complement in presence of the antigen. Any lack of adjustment is made visible by a lack of correspondence between the tubes of the two rows.

REFERENCES.

(1) *League of Nations. Health Organization, Official No. C. H. 726, 1929, III, 3, p. 114.*
(2) Medical Research Committee (now Council). *The Wassermann Test*, 1918.

AN INQUIRY INTO THE PHYSICAL CONDITIONS OF INDIAN LABOUR.

(A PRELIMINARY COMMUNICATION.)

By DR. P. V. GHARPURÉ, M.D. (Bom.),
Grant Medical College, Bombay,
and
S. G. LATEY, B.COM. (Bom.).

THIS inquiry was undertaken with the object of making preliminary observations on the conditions of Indian labour. All the equipment required was purchased with a view to ascertaining the total cost of such a preliminary investigation carried out outside the laboratory over a fixed period. A suitable place to carry out such an inquiry was found by us at Khandala* where a large labour camp was situated. The favourable conditions that made us select this place may be summarized as follows:—

The labourers were paid on a daily wage system (payments being made once a fortnight), and purchased their provisions (food and clothing) once a fortnight. They were better paid than the labour available in Khandala village proper. The wage normally existing was about 8 annas per day, as compared with the wage paid in the camp which was one rupee or more.

(*a*) A large sized camp (average population over 5,000) was situated at this place in connection with the "Bhoreghat Realignment Scheme" undertaken by Messrs. Tata Construction Co., Ltd., for the G. I. P. Railway.

(*b*) The camp consisted of a large number of specially erected huts built on a uniform plan.

(*c*) The labour was imported practically from all parts of India.

(*d*) The camp had its own shops, hospital, electric supply and sanitary arrangements.

---

* Khandala is a place situated 70 miles from Bombay in the Poona District, a well known health resort and once a military station under the Southern Command, situated at a height of 1,900 feet above sea-level. The rainfall was on an average 200 inches. The village called Khandala proper is a small one with a population of about 2,000. It has a government dispensary.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*e*) The hours of work were fixed, either by day or night.

(*f*) The camp was well organized and we were promised all facilities by the authorities concerned.

The following general observations regarding the labour may be made. The labourers had their own boarding houses. Often a group of labourers employed one from amongst themselves to cook for all and paid his daily wage in return for his services. Many of them lived with their families. They were poor and had no reserve fund to start with. They had on the whole very poor ideas of personal hygiene, but were willing to change their habits on being told, and shown the importance of cleanliness, e.g., bathing, the use of soap, etc.: they had no prejudice against western methods of treatment. They were on the whole congenial and helped us in our inquiry. They had their own prejudice about working inside the tunnels, but most of them were willing and capable of picking up new work which naturally increased their income. The composition of the camp varied.

The inquiry was restricted to such of the labour as had a semi-permanent residence, the floating population of the labour force being eliminated as far as possible.

The inquiry was carried out by the interview system, and the details were directly written down on a card specially printed for that purpose.

Medical

Serial No.			Ref. No.
Age	Sex	Height	Weight
No. of teeth	Condition of teeth		
Varicose veins	Skin disease		Lice
Vision	Colour vision		Reaction to light
Spleen			
Liver			
Lungs			
Heart			
Knee jerks			
Syphilis	Gonorrhœa		
Dysentery	Malaria		
Worms	Tuberculosis		
Leprosy	Tumours		
Habits			
Opium	Alcohol		Tobacco

Signature———————

Social

Marriage: Age at marriage:

Children: Living children:

Rate of childbirth:

Economic

Daily earning

Daily expense

Food

Clothing

Habits

Cost of illness to employers { Hospital / Absence

Cost of maintaining order

Signature- ———————

As will be seen from the card the findings were grouped under three main headings:—

(1) Medical,
(2) Social, and
(3) Economic.

Inquiry into family budgets of labourers living with their families was not undertaken.

The findings under different heads have been tabulated and may be taken for what they are worth, especially considering the preliminary nature of the work taken up, with an idea to give us experience to carry out further similar investigations on more elaborate lines.

For purposes of the inquiry we have chosen to group the labour force from a geographical point of view and divide them according to the places they came from. The divisions are as follows:— (1) Frontier (referred to as Pathans in the table and text that follows); (2) from the Punjab, United Provinces and Central India (referred to as Northern Indians); (3) from the Bombay Presidency (referred to as Marathas); (4) from Madras Presidency and Mysore (referred to as Southern Indians); and (5) from Baluchistan and the surrounding areas of Hyderabad, Sind, (referred to as Makranis). It has not been possible for us to study the comparative conditions of vegetarians and non-vegetarians respectively or from any other point of view, owing to various difficulties.

The total number of labourers examined was over 800, but some persons had to be omitted on account of some omissions in the notes. The actual figures obtained by us are approximately representative of the ratio of the actual population to the respective groups made by us.

Medical.

The first section relates to findings in which medical men will be interested, and under this heading are included comparative tables of height, weight, and chest measurement of different classes as an index of physical development in different parts of India.

These tables give a general idea of the development of inhabitants of different parts of India. In the South an average adult male is comparatively thinner and shorter than one from the North. Amongst the groups made by us in this

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

inquiry we have noted that the average Pathan possessed the best physique. Some excellent examples were seen of young males of age between 18 and 20, having lbs. 120 weight, and over 6 feet height. It was a pity we were not able to persuade such men to allow us to take their photographs. Some of the poorest specimens were seen amongst the inhabitants of the Bombay Presidency. Whether this is to be explained by the diet or otherwise we have no data in our possession to conclude. In general it may be stated that the height, weight and chest measurement proportionately increase as age advances up to a limit of 30 years, beyond which there is a disparity in the proportions, especially in the fullness of chest, owing to frequency of chest troubles of some kind being common. It also appears that there is either bending of the vertebral column or absorption of cartilages rather early, explaining the diminution in the height noted above the age 30 years.

near, and colour blindness. The object of the questions was later found very difficult to explain to our subjects, and to understand ourselves their description of the colour, etc., and this detail had to be omitted from the subsequent inquiry. The findings about colour blindness would have been very useful. The only thing possible to do was to note down the reaction of the pupil to light, and evident diseases such as trachoma, corneal opacities, congenital defects, cataract, etc. All these have been grouped under the one title "eye diseases." The malaria incidence was based on splenic enlargement and blood examination. The rest of the diseased conditions have been diagnosed from symptoms complained of or the results of physical examination. Under "tumours" are included only such as were visible externally. This figure cannot be taken as an absolute index of incidence of tumours. In the deeper organs it is not at all uncommon to see tumours in the post-mortem room in India.

TABLE I.

Height, Weight and Chest Measurement in Age-groups in Different Classes.

Age.	Number of cases.	Height.	Weight.	Chest.
Pathans.				
15—20	67	5′ 5¼″	118¼	33⅓″
21—25	93	5′ 6″	124¼	32¼″
26—30	80	5′ 7½″	128⅜	32¼″
31—35	15	4′ 4⅔″	125⅛	33″
36—40	12	5′ 7″	128	33″
41—46	5	5′ 5½″	127	34¼″
Marathas.				
21—25	16	5′ ⅓″	106⅓	32⅛″
26—30	19	5′ 4″	101	32″
31—35	18	5′ ¾″	111	32¾″
Southern Indians.				
15—20	18	5′ 3½″	100⅔	30⅔″
21—25	18	5′ 4⅓″	107	31″
26—30	47	5′ 4″	111	32⅓″
31—35	6	5′ 4″	105	31¾″
36—40	7	5′ ¾″	104	31¾″
Makranis.				
15—20	7	5′	116	32″
21—25	5	5′ 4″	117	32″
26—30	5	5′ 1½″	125	33″
31—35	9	5′ 5″	118	32″
36—40	5	5′ 4″	134	33″
Northern Indians.				
15—20	13	5′ 4¼″	118	30½″
21—25	15	5′ 4¼″	110	31¼″
26—30	16	5′ 5″	120½	32½″

Disease Incidence.

At the commencement of the inquiry an attempt was made to test the vision, distant and

As a control test for ascertaining the value of Chopra's urea stibamine test in kala-azar, this was carried out in all persons having an enlarged

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE II.

Age.	No.	Average. Weight.	Average. Chest.	Average. Height.	Minimum. Weight	Minimum. Chest.	Minimum. Height.	Maximum. Weight.	Maximum. Chest.	Maximum. Height.
Pathans.										
16	(7)	108	30¾″	5′ 3″	92	29″	4′ 11″	120	33″	
17	(10)	115	30½″	5′ 5″	102	28½″	5′	120	32½″	5′ 7″
18	(15)	116	30 1/16″	5′ 6″	100	17″	5′ 3″	138	35″	5′ 7″
20	(31)	121	32″	5′ 5″	94	28″	5′ ½″	138	35½″	5′ 8″
21	(9)	142	33⅓″	5′ 6″	118	31″	5′ 2½″	148	35″	5′ 10″
22	(19)	127	32″	5′ 6½″	100	30½″	5′ 3″	152	34½″	5′ 10″
23	(9)	118	32″	5′ 4½″	106	30″	5′	128	34½″	5′ 10″
24	(5)	118	32″	5′ 4″	114	30″	5′ 3″	124	34″	5′ 10″
25	(51)	129	33¼″	5′ 6″	100	29″	5′ ½″	158	37″	5′ 2″
26	(14)	123	32¾″	5′ 5½″	97	31″	5′ 3½″	153	35″	6′
27	(12)	126	32¾″	5′ 6¼″	112	30½″	5′ 3½″	138	34″	5′ 7½″
28	(12)	129	33¼″	5′ 6″	118	32″	5′ 2″	138	36″	5′ 11″
30	(38)	129½	33½″	5′ 6″	106	31″	5′ 1″	155	36½″	5′ 8½″
35	(7)	123	33″	5′ 4″	94	30″	5′ 4″	132	35″	6′
40	(10)	128	33″	5′ 7″	113	31″	5′ 3″	140	34½″	5′ 7″
45	(5)	127	34¼″	5′ 4″	120	34″	5′ 4″	145	35½″	5′ 10″
Marathas.										
20	(8)	104	31″	5′ 3½″	94	29″	4′ 11″	114	32″	5′ 6″
22	(8)	104	31″	5′ 4″	88	28″	5′ 1″	126	33½″	5′ 7″
25	(19)	107	31¼″	5′ 4¼″	86	28½″	4′ 11″	123	33¼″	5′ 8½″
30	(13)	101	32″	5′ 4″	86	30″	5′	134	36″	5′ 8″
35	(5)	111	31¾″	5′ 5¾″	94	30″	5′ 3½″	126	33″	5′ 7″
Southern Indians.										
18	(6)	97	30½″	5′ 1″	82	28″	4′ 9″	106	32″	5′ 4″
20	(12)	102½	30¾″	5′ 4½″	86	27″	5′ 1½″	128	34″	5′ 8″
23	(5)	113	31½″	5′ 5″	98	30″	5′ 1″	128	33¼″	5′ 8½″
25	(13)	105	30¾″	5′ 4½″	92	29″	5′	125	32½″	5′ 8″
26	(5)	105½	31″	5′ 3″	92	29″	5′	112	32¼″	5′ 5″
28	(7)	104	31½″	5′ 2″	96	30″	5′	116	34″	5′ 6″
30	(35)	110	33″	5′ 4¼″	88	29″	5′	142	36½″	5′ 10″
35	(6)	105	31¾″	5′ 4″	98	30½″	5′ 1″	120	34¼″	5′ 10″
40	(7)	104	31¾″	5′ 3¾″	92	30½″	5′	118	35″	5′ 6½″
Makranis.										
20	(7)	116	32″	5′ 3″	100	29½″	5′ ½″	130	33½″	5′ 6″
22	(5)	117	32″	5′ 4″	100	30½″	5′ 1½″	130	34″	5′ 7½″
30	(6)	125	33″	5′ 5½″	106	32″	5′ 2½″	140	35½″	5′ 7½″
35	(9)	118	32″	5′ 5″	96	29½″	5′ 3½″	144	38½″	5′ 8″
40	(5)	134	33″	5′ 4″	116	31″	5′ 3½″	178	36″	5′ 8″
Northern Indians.										
19	(6)	104	30½″	5′ 4½″	86	28½″	5′ 1″	120	35″	6′
20	(7)	110	30½″	5′ 4″	100	29″	5′ 2″	122	35″	5′ 9″
22	(7)	113	30¼″	5′ 5½″	98	29½″	5′ 3″	128	33″	5′ 9½″
25	(8)	107	31″	5′ 3¼″	94	29″	5′ ½″	117	33¾″	5′ 5½″
28	(9)	121	33½″	5′ 6″	110	30″	5′ 2½″	138	35″	5′ 9″
30	(7)	119	32″	5′ 3¾″	94	29″	5′ 1½″	172	36″	5′ 10″

spleen. It was noted that except for one all sera gave a negative reaction. The blood showing a positive reaction was sent to the laboratory for culture but unfortunately this was not carried out.

The cost of medical aid given to all inmates of the camp was only about Rs. 2,000 per mensem, including the salary of two doctors, a compounder, and two hospital servants, etc., and drugs and dressings.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE III.

Table showing Disease Incidence in Percentages in Different Classes.

Disease.	All classes.	Pathans.	Marathas.	Southern Indians.	Makranis.	Northern Indians.
	675	310	95	130	58	82
Malaria	33.0	43.6	38.9	23.3	15.5	13.8
Worms	6.2	5.5	9.0	1.5	20.8	2.4
Dysentery	9.6	8.4	9.0	7.7	24.1	7.3
Skin diseases	10.2	11.0	19.0	6.8	3.3	6.0
Body lice	0.7	0.03	0.0	1.5	1.1	0.0
Varicose veins	6.07	6.1	9.0	5.4	3.3	4.9
Bad teeth	27.8	33.2	17.0	23.8	32.2	20.7
Venereal diseases	9.1	6.1	14.0	10.0	15.5	8.5
Tuberculosis	0.6	0.03	1.0	0.7	1.1	0.0
Joint pains	0.6	0.1	0.0	0.0	0.0	0.0
Leprosy	0.1	0.0	0.0	0.7	0.0	0.0
Eye diseases	7.8	5.5	2.0	9.2	10.3	4.9
Enlarged spleen	13.9	18.0	21.0	6.8	10.3	2.4
Enlarged liver	1.6	1.6	2.0	3.3	0.0	0.0
Lung diseases	8.0	4.5	11.0	20.0	7.0	6.0
Heart diseases	1.1	0.06	0.0	0.7	7.0	1.2
Knee-jerk abnormal	1.4	1.6	1.0	1.5	0.0	2.4
Wounds	1.4	0.1	1.0	3.3	0.0	0.0
Deformities	0.1	0.03	0.0	0.0	0.0	0.0
Tumours	0.2	0.03	0.0	0.0	0.1	0.0
*Urinary diseases	0.1	0.03	0.0	0.0	0.0	0.0
Defective speech	0.1	0.0	1.0	0.0	0.0	0.0

* Not including venereal.

A FURTHER NOTE ON THE TREATMENT OF VESICO-VAGINAL FISTULA BY RECTAL TRANSPLANTATION OF THE URETERS.

By F. C. FRASER,

LIEUTENANT-COLONEL, I.M.S.,

District Medical Officer, Malabar.

IN a previous paper published in this journal (*Indian Medical Gazette*, Vol. LXIV, June 1929), I touched upon most of the difficulties that might militate against a successful operation. Since then I have operated upon more cases and as a result of the experience gained I am able to add two more very important points to the list of eight previously given (*loc. cit.*).

The presence of a torn perineum or atonic sphincter ani.—In one of our recent cases, after the completion of the two abdominal operations, I was greatly mortified to find that the patient could not retain urine in her rectum and on coming to examine the cause, I discovered that she had had an old tear in the perineum which had involved the sphincter. A third operation had to be undertaken to repair the perineum; this was successful and the patient left the hospital dry and happy.

Wise after the event, it seemed surprising that such a possibility had not suggested itself to us before, for patients badly torn about the vagina are more than likely to be torn about the perineum. Now every patient is carefully examined to see if the sphincter is in a condition to bottle up urine, and secondly to see if any recto-vaginal fistula is present before we commit her to any severe abdominal operation. If the perineum is found to be incomplete, a radical cure is first carried out, as this is more likely to be successful when the rectum is comparatively dry than when full of a mixture of fæces and urine. In the case mentioned above, the operation was quite successful in spite of the rectal contents being liquid.

The danger of giving enemata after the operation.—Recently we lost the first and only case in our long series of operations, and this was due to an Indian nurse giving a copious enema to the patient without having received instructions to do so. The danger of such a proceeding is so obvious that I had not thought it at all necessary to issue instructions against such a possibility. The nurse appears to have given the enema as part of the usual routine after abdominal operations if the bowels are not open on the third day. In this case there was even less necessity as the patient was passing urine by the rectum. A copious soap and water enema was given and the patient exhibited signs of collapse within twenty minutes. She died three hours later exhibiting all the signs of peritonitis and very profound shock. No post-mortem was allowed but there can be no doubt but that the rectum was distended until the transplantation site was burst open and the rectal contents escaped into the peritoneal cavity. Similar accidents have been reported after appendectomy, the stump being burst open by giving a high enema. Personally I always issue a warning that no enema is to be given after the latter operation; it now seems to be none the less necessary to issue a similar warning after transplantation of the ureters.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A NOTE ON MUSEUM MAKING.*

By DR. P. V. GHARPURÉ, M.D. (Bom.),
Grant Medical College, Bombay.

THE main object in exhibiting objects in a museum is to give prominence to essential parts of the material in its natural position and appearance as far as possible.

In the preparations required for an Anatomy Museum of the Pathology Department I experienced certain difficulties and I have used certain methods which I propose to describe here.

The main steps in the preparation of museum preparations from wet material may be summarized as follows:—

1. The object must be obtained fresh as possible.
2. No time should be lost before it is dealt with.
3. No agent which will produce hæmolysis should be allowed to come in contact with it, but it should be washed in normal strength of salt solution.
4. The fixing of the object should be carried out immediately.
5. The fluid used for fixing must be at least ten times the volume of the preparation, but not much more.
6. In the case of a bulky preparation its interior should be injected with the same fluid.
7. The preparation when put in "fixing fluid" must be kept away from light and at room temperature. Fixing at lower temperature fails.
8. The preparation must not be allowed to come in contact with the container.
9. Heavier objects must be suspended and lighter ones weighted down.
10. The container must not be sealed but ample ventilation must be allowed. An unglazed earthenware container should serve admirably or a wooden cask.
11. The preparation must not be allowed to remain too long in the fixing fluid. The moment it is observed to change the colour of the fluid to turbid red, it must be transferred to another quantity of fixative. Such repeated baths must be used, sometimes every 12 hours, if one expects excellent results.
12. As soon as one comes to a condition when no further colour is given to the fixing fluid the preparation should be transferred to running water and kept under the tap for a few hours and then transferred to the preserving fluid.
13. I have never found it necessary to use spirit or alcohol to recover colours.
14. The preparation is allowed to remain in this second or preserving fluid for at least six months before it is mounted as a museum object.
15. If these details are followed one gets reasonably good results.
16. Fresh sections as a rule should not be made after these stages are gone through. The best stage to do sectioning is during the preliminary fixing after the first 24 hours.

The composition of the fluid described by the International Association of Medical Museums was not found by me to be satisfactory.

I made the following alterations:—

(1) *Fixing.*—Double the amount of formalin, common salt and chloral hydrate.

(2) *Preserving.*—Double the amount of common salt.

My own experience is that glassware is not required at all except for mounting the exhibits; wooden casks are cheaper and serve best for stocking, fixing, preserving, etc.

The second method of preparing museum mountings is more attractive and useful for teaching purposes.

It consists of embedding a thin slice of any organ in a glycerine-gelatine mixture of such a consistency that it remains solid at room temperature at all times.

In the publication of the International Association of Medical Museums a composition of such a mixture is given which may be best suited for climates which are different from that of Bombay. I could not succeed in getting a solid block with that composition in Bombay.

On investigating the causes I found that the glycerine of the mixture abstracted a large amount of moisture from the atmosphere. I worked up the total amount of moisture abstracted by every 100 c.c. of the mixture and obtained in this way an altered composition of the mixture. The original formula and the one now in use with me are shown in the following table.

TABLE.

The following table shows the difference in the compositions.

Fixing Fluid.

	Original.	Revised.
Sod. Sulph. ..	11 grams	11 grams.
Sod. Bicarb. ..	10 ,,	10 ,,
Sod. Chloride ..	9 ,,	18 ,,
Potass. Nitrate ..	19 ,,	19 ,,
Potass. Sulphate ..	1 ,,	1 ,,
Chloral Hydrate ..	50 ,,	100 ,,
Formalin ..	50 c.c.	100 c.c.
Water	1,000 ,,	1,000 ,,

Glycerine-Gelatine Mixture.

	Original.	Revised.
Gelatine ..	80 grams	140 grams.
Sat. Soln. of Arsenious Acid.	200 c c.	200 c.c.
Glycerine ..	800 ,,	1,000 ,,

It will be observed that the proportionate quantity of arsenious water had to be reduced and the gelatine percentage proportionately increased.

This mixture keeps indefinitely and solidifies and remains solid throughout the year.

I have some preparations made in 1926 which are still in perfect condition.

Such preparations are of great use in sending round in a class room while one is lecturing.

* Read before the British Medical Association, Bombay Branch, on 19th July, 1929

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

DYSENTERY IN THE CENTRAL JAIL, RAJAMANDRY, MADRAS PRESIDENCY.

By SUB-ASST. SURGN. CH. KRISHNAMURTY, L.M.P.,
Central Jail, Rajamandry.

DYSENTERY is one of the most prevalent diseases in this jail. A careful investigation was made in 1928, and measures taken to reduce its incidence with some success. The fresh stool of every case was microscopically examined, and a diagnosis of the type of dysentery present arrived at. The following are the figures:—

Year.	Percentages Amœbic.	Bacillary.	Mixed.	Case mortality. per cent.
1927 ..	5·5	94·5	..	8
1928 ...	10·0	88·4	1·6	2

The disease is chiefly spread here by flies, and its incidence is directly proportional to the fly prevalence. January is the month of heaviest incidence, and the disease then gradually abates until it is almost absent in April. It again commences about July, and again wanes in November. There are thus two periods of the year when the disease is prevalent, with a quiescent period in between. That the disease is very prevalent in January probably throws some light on its epidemiology; January is an extremely cold month in Rajamandry, and the moisture does not dry up quickly. Flies are very numerous and active at this time. There is no rainfall during January, as a rule.

A fly-proof ward was constructed and almost all cases of dysentery segregated in it. Stringent measures were taken to prevent infection of food supplies and water, and all latrines were fly-proofed. General sanitary control was tightened up in 1928, and all possible breeding places of flies searched for and cleaned. Fly killers and fly papers were freely used inside the jail.

After the type of disease present has been diagnosed microscopically, appropriate treatment is given. Experiments were carried out in 1928 to try and determine the best line of treatment, with due regard to expense and efficiency. In 1927 all acute bacillary cases were treated with salines; but in 1928 a new departure was made, and polyvalent anti-dysentery serum of the Lister Institute was used for all acute cases in a dosage of 20 c.c. The effect of this measure on the temperature chart, the number of stools, and the abdominal pain is very marked. The earlier the serum is administered, the more marked is its effect. If the case is seen late, two doses, each of 20 c.c., may be required; we have had no occasion to give a third dose; and if the disease is of more than 48 hours' duration the serum is of no value.

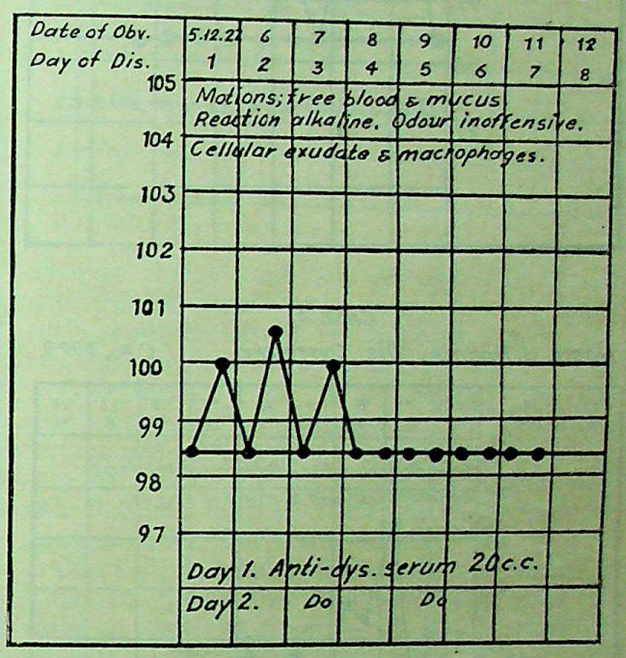
On admission every patient received immediately a dose of Mist Olei Ricini (B. P.). As a rule, with the preliminary dose of castor oil mixture and serum treatment, the patients became convalescent in three to four days, and were discharged to duty a week after admission.

After discharge from hospital all cases were kept under control, segregated from the other prisoners, for one month in a separate dysentery block. During this period intestinal antiseptics such as hydrarg. perchloride, bismuth and salol, or a mixture containing thymol, dilute hydrochloric acid, and liquor arsenicalis was given. This last prescription appeared to have especially good results. Diet during this period was restricted to buttermilk and rice for a period of from 15 to 30 days according to the initial severity of the disease. There were no relapses.

The attached temperature charts illustrate the value of treatment by the castor oil mixture and anti-dysenteric serum.

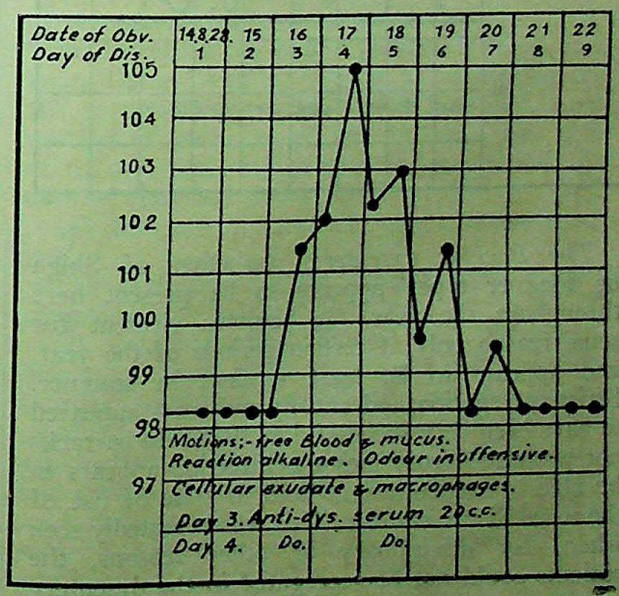
CASE. 1.

Name. V. pathi. Dis. B. Dysentry. C. No. 5988.



CASE 2.

Name. K. Kotadu. Dis. B. Dysentry. C. No. 7136.

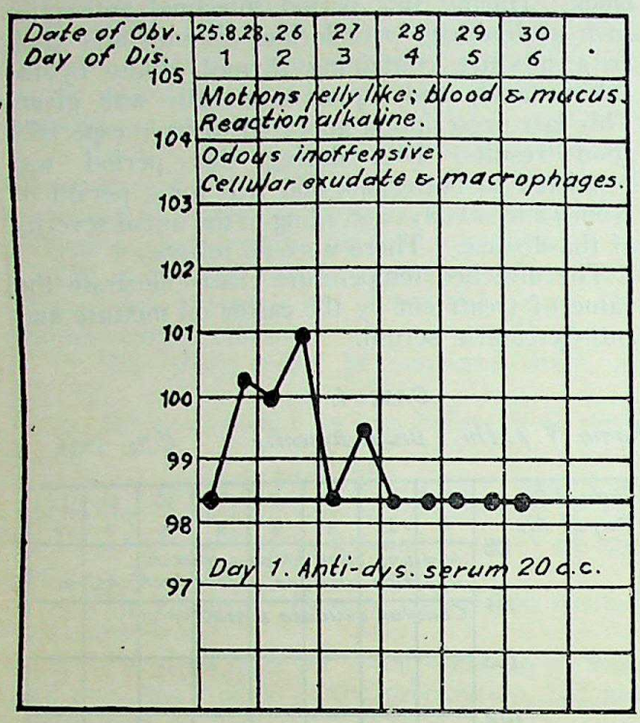


CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

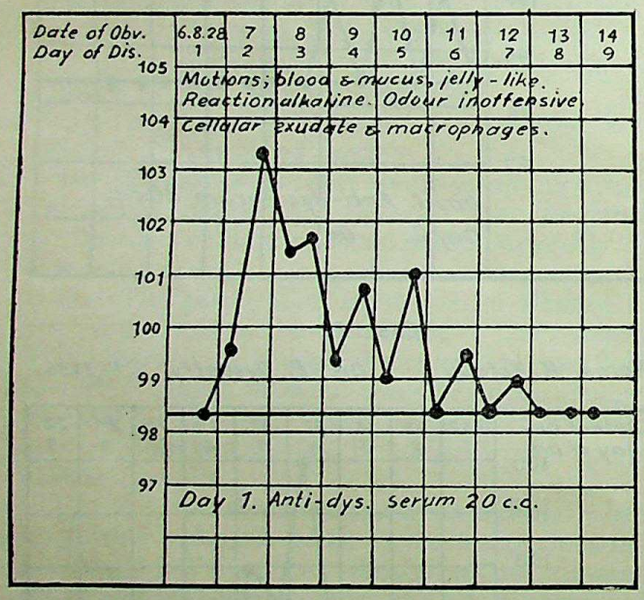
CASE. 3.

Name. R. Kudu. Dis. B. Dysentery. C.No. 7367.



CASE 4.

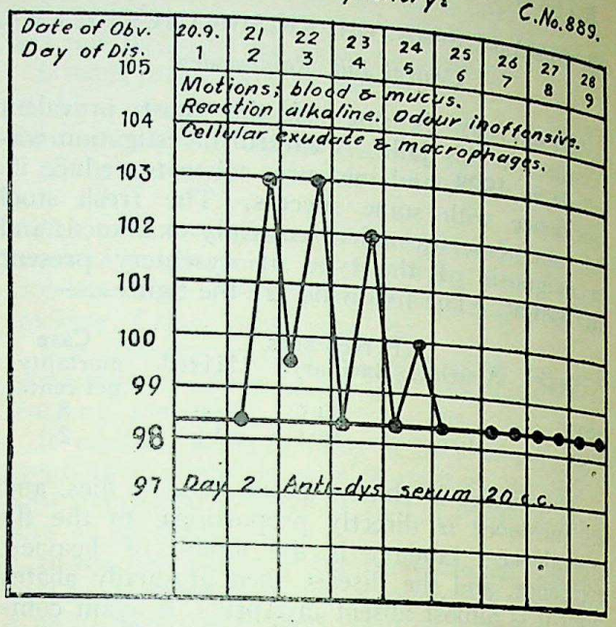
Name. J. Narme. Dis. Dysentery. C.No. 3929.



The Bacillus dysenteriæ (whether of Shiga or Flexner type) appears to be present here throughout the year. It becomes virulent for some reason only at certain periods of the year, and appears to be least virulent in summer. Strict segregation and anti-fly measures appeared to have been very successful in 1928. In barracks not protected from flies the infection appears to be able to secure a firm hold in spite of use of the usual disinfectants. This was repeatedly seen when, for disciplinary or other reasons, the patients could not be segregated in the dysentery ward.

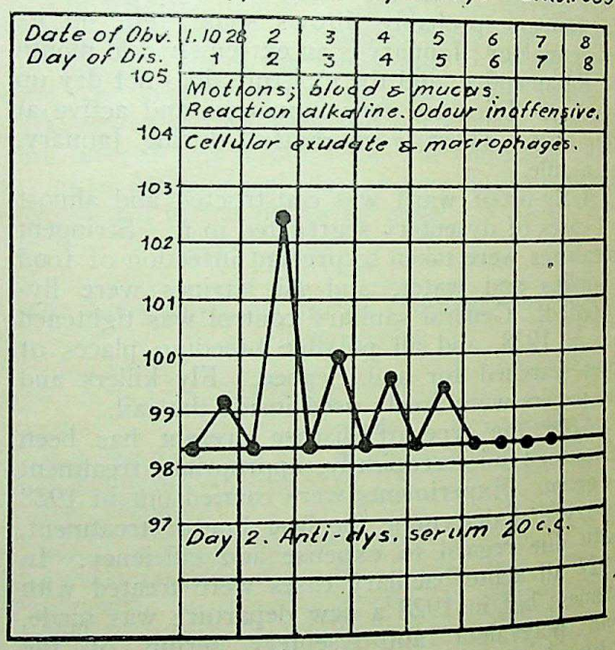
CASE. 5.

Name. V. Dhom. Dis. B. Dysentry. C.No. 889.



CASE 6.

Name. M. Narayya. Dis. Dysentry. C.No. 7383.



In about 100 cases treated with anti-dysenteric serum, serum anaphylaxis was never seen. We have used rather smaller doses of the serum than are recommended by Manson-Bahr, as the dysentery was most of less virulent type, and usually due to the bacillus of Flexner.

A comparative study of the cases treated in 1927 by salines and those treated in 1928 by castor oil mixture and anti-dysenteric serum shows the much superior value of the second method. In 1927 the average stay in hospital was 13 days as against 7 days in 1928. Though salines remove toxins as rapidly as they are formed, there is often a prejudice among the majority of patients against taking purgatives when they are already being purged.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

My thanks are due to Dr. C. R. Kameth, M.B., C.M., Medical Officer, Rajamandry Jail, for kind permission to publish these notes.

NOTES ON MALARIA IN THE SIBSAGAR DISTRICT, ASSAM.

By ASSISTANT SURGEON J. M. SEN GUPTA, M.B., D.T.M. (Bengal),
Assam Medical Service (Senior), Sibsagar.

THE very word "Assam" at one time used to fill the minds of people of other provinces in India with a sense of fear and awe, as it was considered to be a province saturated with both malaria and kala-azar. This idea is to-day passing away gradually, as it has been found that certain portions of Bengal are no less infested with both diseases, and as bad as the worst districts in Assam. Not only was such an idea prevalent among laymen at one time, however; it also prevailed among the medical profession.

Such a belief is to be attributed chiefly to lack of accurate information on the subject. This year, Lieut.-Col. R. Knowles, I.M.S., in the closing lecture of his course on medical protozoology at the Calcutta School of Tropical Medicine, deplored that information on the subject of the parasitology of malaria in India was so meagre that workers on the subject had to depend on utterly insufficient data and out of date information. If I am not mistaken* the figures given by him for Assam were roughly as follows:—

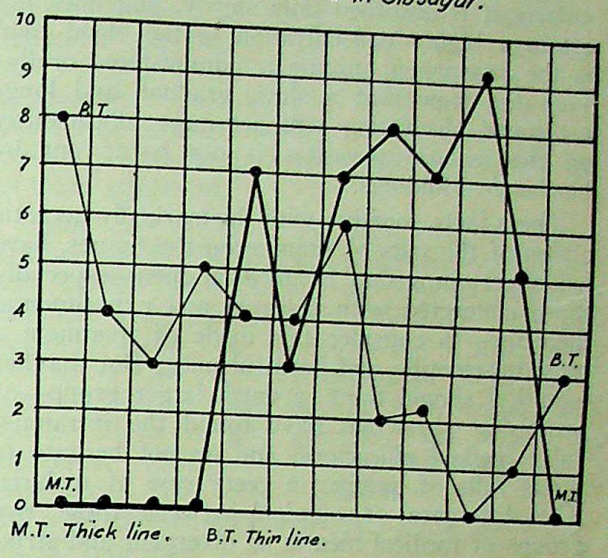
P. vivax infections; not seen.
P. malariæ infections, 2 per cent.
P. falciparum infections, 98 per cent.

In my experience, however, this percentage seems to indicate much too high a figure for *P. falciparum*, whilst *P. vivax* infections are so common here that one would give them an equally high percentage with those due to *P. falciparum*. In 1923 I kept a record of all blood examinations which I carried out during the year, and the results are shown in the accompanying chart.

In this chart *P. vivax* and *P. falciparum* infections alone are shown, and are seen to divide the malaria in Assam fairly evenly between them. *P. malariæ* infections show a small percentage —perhaps about 2 per cent.—but are excluded from consideration. It must be remarked, however, that in some years the percentage of malignant tertian infections rises very abruptly—so much so that almost every case encountered appears to be due to this parasite, and 1928 was such a year.

The present position with regard to the diagnosis of malaria, its various clinical manifestations and complications, and their treatment is very much clearer and more satisfactory than was the case a few years ago. For the treatment of malaria medical men have to fall back upon the drug of old—cinchona febrifuge, and its derivatives—and have to depend on its efficacy, in spite of the fact that innumerable attempts have been made by practitioners and pharmacologists

Seasonal incidence of Malaria in Sibsagar.



alike to invent some new remedy for malaria which would excel quinine in its efficacy. Many such remedies have been proposed, but one by one their gradual disappearance has attested their worthlessness. There is no denying the fact that when quinine is administered in the proper method and in the proper dosage, an uncomplicated case of malaria can be treated very effectively, and that the drug is a specific in the cure of malaria under such circumstances.

On the other hand, notwithstanding the extreme value of quinine in straightforward cases of malaria, there is a group of about an equal number of cases of malaria where it seems to have but little effect. It is in connection with these cases that medical men are driven to variously advocated drugs, to other preparations of cinchona febrifuge, or to pushing dosage to a high degree in the hope of destroying the parasites. Even with so drastic a method as that last referred to, it is not known how high a percentage of cures would be reached. The types of malaria cases which present especial difficulty may be classified as:—

(*i*) Relapses in cases of benign tertian infection.

(*ii*) Malignant tertian malaria with cerebral complications—cerebral malaria.

(*i*) *Benign Tertian Malaria with Relapses.*—Nowadays these cases are treated with cinchona febrifuge—preferably the Indian variety—by oral administration, and the results are on the whole satisfactory. There is another school, however, who prefer intramuscular injections of quinine acid hydrobromide or hydrochloride, and consider this method to be far superior to oral administration of either quinine or cinchona febrifuge. Six injections are given, each of

*Not correct, and, one believes, not correctly quoted. The figures, on some 4,000 films examined at all seasons of the year by several different workers in Assam, are:—

P. vivax	.. 1,086 cases	—36.3 per cent.
P. malariæ	.. 298 cases	— 9.9 per cent.
P. falciparum	.. 1,610 cases	—53.9 per cent.

P. falciparum predominates.—R. K.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

8 grs., on six consecutive days. How such a procedure should have a beneficial action it is very difficult to understand in view of the facts that (*i*) the total quantity of quinine injected is only 48 grains, and the medicinal efficacy of such a small quantity of the drug in curing relapsing malaria is impossible to understand; whilst (*ii*) when quinine is injected intramuscularly it is absorbed only slowly, and does not attain a higher concentration in the blood than is the case when quinine is administered orally; (*iii*) the view that a slow, gradual, and long-continued absorption will act more efficaciously on the malaria parasites is not borne out by biochemical findings.

These facts, together with the markedly necrotic action of the salts of quinine on the tissues, have led a certain group of medical men—especially those connected with research and experimental medicine—to consider this mode of treatment a most unscientific and harmful one. But another —and, I should think, a much larger group—of practising physicians have found the intramuscular method efficacious, and do not hesitate to inject salts of quinine in every case of malaria. The difference of opinion between these two groups of medical men is so divergent and striking that one does not know what to do; whether to abandon intramuscular administration entirely, or to continue with it until some harmful result is evident.

I was faced with this problem when attending the D. T. M. class at the Calcutta School of Tropical Medicine. The harmful results of intramuscular quinine were put before us so vividly by the professors at the School that it disturbed some of one's most fundamental beliefs. I had been accustomed to giving quinine intramuscularly to a large percentage of my cases of chronic malaria, and had used the method in at least one hundred patients, without seeing any harmful results. I had had no occasion to repent using this mode of administration. I enquired of a number of doctors who were attending the D. T. M. class, and was informed that none of them had seen any untoward consequences—on the other hand their experience was that the method was most satisfactory. What, then is the solution to this difficulty? Sir Leonard Rogers prefers cinchonine bihydrochloride intramuscularly, and reports very favourably on it, (*Recent Advances in Tropical Medicine*, 2nd edition, p. 81). I have found that results are better when grain ½ of emetine hydrochloride is combined with the quinine acid hydrobromide, grains 8 to 10. The emetine is added with the idea that the liver function is very much upset in malaria, and that emetine may overcome this.

Anyhow, the question of intramuscular quinine is an important one, and should be investigated. Neither school of opinion can be ignored, but each should receive the views of the other with due consideration, and a decisive opinion be arrived at. I have not mentioned here the beneficial effects of adding intramuscular injections of quinine to its oral administration in acute cases of malarial fever, where the dual mode of administration very much enhances the efficacy of the drug.

(*ii*) *Cerebral Malaria.*—This is responsible for a very high percentage of the deaths caused by malaria. The treatment of these cases is not only difficult, but is also very uncertain, and the physician is often faced with many hours of anxiety in connection with them. The routine method of treatment is the intravenous injection of quinine, given as frequently as one can safely introduce it into the system. By this I mean what a learned professor expressed by saying "It is better to allow the patient to die of quinine poisoning rather than to die of malaria." I have had occasion to treat a large number of cases of cerebral malaria, and have treated them by intravenous quinine, combined with quinine intramuscularly, or given by the oral route wherever possible. I kept one man alive for about ten days by intravenous injections of glucose, with intravenous injections of grains 10 of quinine morning and evening. The parasites (and even the crescents) gradually disappeared from the peripheral circulation, but he made no progress and eventually died. In my series prior to 1928 results were uniformly unsatisfactory, especially amongst the cases which were not brought for treatment until twelve hours or later after the onset of cerebral symptoms.

In 1928, as previously mentioned, there was a very high incidence of malignant tertian and cerebral malaria, and this afforded me a unique opportunity of studying the treatment of this condition. The first patient in whom results were satisfactory was a man who had become maniacal, was considered by his relatives to have become possessed of a ghost, and treated as such for not less than twenty-four hours. When I first saw him he was completely unconscious, the temperature a little over 100°F., the conjunctivæ intensely congested, and frothy saliva dribbling from the mouth. At times he would become so violent that it took three or four persons to keep him under control with some difficulty. Blood examination showed a very heavy infection with *P. falciparum*. I gave him an injection of morphine and hyoscine hydrobromide, and the usual intravenous quinine. Next day I repeated the intravenous quinine, but omitted the morphine and hyoscine. The treatment proved extremely successful; it kept the patient quiet, and controlled the fever, though it was eight days before he was out of danger.

My second case was a similar one, the servant of a villager, who became suddenly unconscious one afternoon, and was supposed to have become possessed by a ghost. He was not brought to me until the next afternoon. On admission he was comatose, and blood examination showed a very heavy infection with *P. falciparum*. He was also given hyoscine hydrobromide and intravenous quinine; also a daily enema, as he was very constipated. On the third day of treatment

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

he became fully conscious, and in a week's time had recovered.

Since then, myself and my Sub-Assistant Surgeon Romesh Chandra Choudhury have used hyoscine hydrobromide as a routine injection for such cases, in addition to intravenous quinine, adding morphia only when the patient shows signs of being violent. Quinine is given in 8 to 10 grain doses twice a day, either intravenously or intramuscularly. We have not had a single death since adopting this procedure.

The contrast between the two groups of cases, with and without hyoscine and morphine in addition to the quinine, is so striking that one naturally seeks for some explanation. The efficacy of the hyoscine treatment is probably due to the anti-spasmodic action of the drug, which by relieving vascular constriction of blood vessels relieves the tendency towards choking of the internal visceral capillaries with red corpuscles loaded with parasites, keeps the circulation active, and exposes the parasites to the full action of the quinine.

(Since the above was written, a further case of malignant tertian malaria has come under my treatment. The clinical symptoms were such that the patient was admitted to the isolation wards as a case of cholera. Examination of his blood, however, revealed the true diagnosis. Under treatment the intestinal symptoms began to abate, but cerebral symptoms supervened; he became almost unconscious, his eyes became intensely congested, whilst at times he was almost violent —the whole picture rather suggesting uræmia, had one not known what the true diagnosis was. This patient was also treated by hyoscine and quinine, and made a sound recovery, being discharged from hospital cured within a fortnight from admission.)

NOTES ON THE USE OF CARBON TETRACHLORIDE.

By S. C. NAG,
Barbheel Tea Estate Hospital, Bargang P. O., Tezpur, Assam.

ALTHOUGH the result of carbon tetrachloride treatment in hookworm disease is very satisfactory, and the great majority of physicians consider it to be without danger, it has been reported by several that toxic symptoms ensue in some cases, and that some of these cases end fatally.

In the course of administration of this drug I have noticed the following cases where toxic symptoms ensued.

Series 1.—The drug was administered for hookworm infection to 342 adults of both sexes, all of them tea garden coolies. Of these, 5 patients exhibited toxic symptoms two to four hours after taking the drug, the symptoms roughly simulating a mild type of hæmoglobinuric fever, with a slight rise of temperature, vomiting, restlessness, very high coloured and scanty urine, a coated tongue, jaundice, giddiness, and sometimes slight delirium. Some of these patients were very anæmic before the drug was administered; others were only slightly anæmic. The patients were all females. One of them passed roundworms, and had incessant vomiting; so irritable was her stomach that she could not even keep down a cup of water; she was in this condition for four days, and then a dose of oil of chenopodium, followed by a purgative, removed all toxic symptoms and she recovered completely. The four other patients were treated with magnesium sulphate and diaphoretics. There was no death in this series. The series included twenty women who were at various periods of pregnancy, but who exhibited no toxic symptoms.

Series 2.—A total of 289 (non-working) children, aged between 3 and 11 years, was treated with carbon tetrachloride, and out of these 4 exhibited symptoms roughly simulating those of hæmoglobinuric fever. Suppression of urine was present in two. The symptoms in these cases came on earlier than in Series 1—within 24 hours. Three of the patients died, and one recovered. (No post-mortem examinations were permitted.) Ten other children in this series had mild febrile symptoms with slight giddiness, but all recovered.

Dose and Mode of Administration.—In Series 1 the drug was given in 60 minim doses in water once on an empty stomach, followed by 1|2 to 1 oz. of sulphate of magnesia in 1|2 to 1 hour. In Series 2 the drug was given in accordance with the instructions in the *British Medical Journal* of 1st July, 1922, by Nicholls and Hampton (10 minims for a child 1 year old, increased by 2 minims for each year of age), and magnesium sulphate was given 1|2 to 1 hour later. Alcohol was not taken by any of the patients who fell ill.

The drug used in both series was that made by Messrs. Merck & Co., of Germany, and was supplied by a reliable firm of chemists in Calcutta in the original bottles. (The use of only chemically pure carbon tetrachloride is advocated by all authorities, but it is not possible for a large number of practitioners in the rural districts to determine whether a given preparation is chemically pure or not. It is very desirable that some of your readers would kindly give in the *Indian Medical Gazette* some simple test for determining whether a given supply of the drug is chemically pure or not. A drug supplied by Messrs. Merck & Co. must presumably be unimpeachable.)

Discussion.—It is impossible to say whether the above symptoms were due to any trace of impurity in the drug due to the effect of a hot climate, or occurred in spite of the drug being chemically pure. The jaundice in some of the cases observed may have been due to obstruction of the common bile duct by roundworms, since Ascaris infection is exceedingly common here. The other symptoms may have been secondary to absorption of bile after such an event. Whatever the cause, it seems to me desirable to publish this record, with a view to discussion and to elicit the opinions of authorities.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MALARIA THERAPY IN TABES DORSALIS.

By B. G. VAD, M.D.,
and
N. W. KULKARNI, M.D.,
Sir J. J. Hospital, Bombay.

UNTIL the brilliant discovery of Wagner von Jareggs, the treatment of neuro-syphilis has always eluded a satisfactory solution. Tabes dorsalis and general paralysis of the insane being very resistant, even to the prolonged treatment by the usual anti-syphilitic measures, various new lines were tried from time to time, but none of the new treatments could be said to have even touched the fringe of the problem. In 1912 Swift and Ellis introduced intrathecal administration of salvarsanized serum, but the results fell short of expectations. Sicord in Paris injected minute doses of neosalvarsan directly into the spinal canal after dilution with aspirated cerebro-spinal fluid. Byrnes tried horse serum mercurialized *in vitro*. Ravaut, Arbeit and Rabean injected intraspinally a hypertonic solution of neosalvarsan mixed with the patient's own serum. Swift, Waller, Haller and others from time to time reported some good results by the intrathecal administration of these anti-syphilitic drugs, but a reliable solution could not be said to have been achieved. Therefore remedies on altogether new lines were introduced. Thus Hilgermann tried spirochætal vaccines and recorded some good results. Jacobs and Heidelberger of the Rockefeller Institute introduced tryparsamide, and though Wolfohn of San Francisco, Solman and Viet of Boston, and others recorded cases showing marked improvement after treatment with tryparsamide, the problem of tabes and general paralysis remained materially unsolved. Then came the discovery of Wagner von Jareggs introducing malarial therapy, which time has proved to be a reliable remedy for general paralysis and to a great extent also for tabes dorsalis.

Observations were carried on by us on 16 cases, 10 of which were treated with the common anti-syphilitic measures only, 5 were treated with malarial therapy and one case by injection of hydrarg. perchloride lotion into the cisterna magna. For a summary of these 16 cases we may refer to Table I. The 6 cases treated by malarial therapy and injection of hydrarg. perchloride lotion into the cisterna magna are given below in some detail.

Case 1.—J. D., aged 50, seaman, was admitted to the hospital on 31st October, 1927, for lightning pains in the right side of the neck and face for the last ten months. He had been infected with syphilis 20 years before. The present complaint first attracted his attention two years ago, when one morning he felt a sudden giddiness and pain while washing his face. Attacks of pain in the lower extremities started suddenly about 18 months previously.

On examination, patches of anæsthesia were noticed on the nose, chest and medial side of the legs and in the urethra. The testicular sensation was markedly diminished, practically absent on the right side. The vibration sense was absent in the lower extremities. Hypotonia, tabetic gait, and Romberg's sign were present. The knee-jerks were very sluggish, ankle jerks lost on the left side, extremely sluggish on the right. Fundi oculi normal. Vision 6|12 in both eyes. Hypermetropic astigmatism present.

The Wassermann reaction of the blood and cerebro-spinal fluid was negative on first examination, but positive after a provocative dose. Lange's colloidal gold reaction shows a tabetic curve. Sugar present, 0.112 per cent. Albumen present, globulin not increased.

For three weeks the patient was treated with drachm doses of potassium iodide and mercury inunctions every day, and a neosalvarsan injection once a week, but no improvement was seen. On 22nd November, 1927, 10 c.c. of blood, containing benign tertian and malignant tertian malarial parasites from a donor was injected intramuscularly. The patient had fever the next day but no parasites were found in his blood. From 30th November, 1927, the patient got fever with rigors, but *P. vivax* was found for the first time on 3rd December, 1927, and *P. falciparum* on 5th December, 1927. On 7th December, 1927, the patient, having shown alarming symptoms, was treated by adequate doses of quinine both parenterally and orally on that day only. Though the symptoms were controlled, the parasites persisted in the blood. From 12th February, 1928, the patient was again given weekly injections of neosalvarsan for six weeks.

Three weeks after the injection of malarial blood, the patient began to show definite signs of improvement. The knee-jerks returned first, then the deep sensation in the testes and the tendo Achillis. The patches of anæsthesia disappeared first on the legs, then on the chest and last on the nose and urethra. The vibration sense was the last to recover; and by the 7th of February, 1928, i.e., in about a week's time after the malarial injection, the patient was clinically cured, though the serological tests remained positive. The patient has been examined from time to time and has not yet shown to this day any return of the signs or symptoms.

Case 2.—Patient S. D. B., aged 40, complained of inability to walk, and a sensation of treading on soft ground. Sensation to deep pressure and pain was lost. Patches of anæsthesia present on the chest and legs. Argyll-Robertson phenomenon in the pupils. Knee-jerks lost. Vision 6|9 dots both eyes, cannot see small objects properly. Optic atrophy present. Romberg's sign present. Cerebro-spinal fluid—12 cells per c.mm., globulin increased. Wassermann reaction on the blood and cerebro-spinal fluid negative.

For one month the patient was given the usual anti-syphilitic treatment, but no improvement was noticed.

On 27th July, 1924, 5 c.c. of blood, containing malignant tertian malarial parasites from a donor was injected and the patient used to get fever with rigors from 28th July, 1924 to 19th August, 1924. The vision in the right eye improved from 6|9 to 6|6, and the gait was better. Patient was again injected with 4 c.c. of blood with *P. falciparum* on 3rd September, 1924, and he got fever with rigors from 6th September, 1924 to 13th September, 1924. From 14th September, 1924, onwards the temperature was normal. The patches of anæsthesia on the legs disappeared, and there was no longer any sensation of treading on soft ground. Romberg's sign was now absent, the patient being able to stand with eyes closed and feet together. The patient having markedly improved, desired to go home and was discharged on 22nd September, 1924.

Case 3.—Patient, P. A., aged 35, admitted to the hospital for ataxia and gradual dimness of vision. Pupils showed the Argyll-Robertson phenomena. Patches of anæsthesia on the face, chest and feet. Romberg's sign present. Tabetic gait. Knee-jerks and ankle jerks lost. Fundi oculi showed primary optic atrophy. Vision—only moving objects seen. Wassermann reaction on the blood and cerebro-spinal fluid positive.

On 11th April, 1924, the patient was injected with citrated blood containing *P. vivax*, but this had no effect. From 1st August, 1924 to 3rd January, 1925, the patient was put through vigorous anti-syphilitic treatment with potassium iodide mercury, and neosalvarsan injections. He was also given strychnine injections in the temporal

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TABLE I.

Cases of Tabes Dorsalis treated by various Astereognosis lines of treatment.

	Register number and year.	Initial.	Age.	Duration of leutic infection.	Precis of signs and symptoms, etc.	Treatment.	Results.	REMARKS.
1	232 / 1924-25	D. A.	30	11 years	Patches of anæsthesia. Loss of jerks. Astereognosis, etc.	Anti-syphilitic treatment. Fifteen injections of neo-salvarsan.	No improvement in any signs or symptoms.	
2	499 / 1924-25; 4933 / 1926-27	A. A.	35	10 years	Vision diminished. Moving objects seen. Argyll-Robertson and Romerg's sign +. Stone blind. Paralysed completely.	Injection of 2 c.c. citrated blood containing B. T. parasites. Strychnine injections in temporal regions +. Vigorous anti-syphilitic treatment.	No reaction and no improvement. Vision improved. No other change. No improvement ..	Improvement in vision only temporary. When admitted again a year after, stone blind. Gradually got worse and expired. (Case No. 3 for details.)
3	1191 / 1924-25	A. A.	30	8 years	Loss of jerks and sensations. Hypotonia and Wassermann test +.	Anti-syphilitic treatment ..	Do. ..	
4	1796 / 1924-25	S. D. B.	40	14 years	Pupils unequal. Vision diminished. Knee and ankle jerks absent. Romerg's sign present. Patches of anæsthesia.	Anti-syphilitic treatment, and injections of blood containing M. T. malarial parasites.	Improvement in gait and other clinical signs.	When seen again after 3 years, improvement was maintained.
5	2218 / 1924-25	S. F.	45	20 years	Anæsthesia on legs and nose. Ankle and knee jerks absent.	Anti-syphilitic treatment ..	No change	Very short stay in hospital.
6	2595 / 1924-25	K. A.	35	12 years	Do. Do.	Do. ..	Do.	Do.
7	4554 / 1924-25	K. N.	45	15 years	Do. Do. Knee—Charcot's joint.	Do. ..	Do.	
8	4813 / 1924-25	G. B.	55	30 years	Optic atrophy. Trophic ulcer on scrotum. Jerks lost.	Vigorous anti-syphilitic treatment.	Do.	
9	1326 / 1926-27	C. T.	55	25 years	Anæsthesia patches. Ankle and knee-jerks absent. Eyeballs, sensation lost.	Anti-syphilitic treatment ..	Do.	
10	1429 / 1926-27	R. S.	47	18 years	Sudden fracture of tibia with thicken-under periosteum, of fibula, left leg.	Do. ..	.....	Short stay. Patient refused to stay any longer.
11	5386 / 1926-27	R. P.	29	7 years	Anæsthetic patches on legs and chest. Loss of jerks.	Do. ..	.....	Do. Do.
12	2145 / 1926-27	M. T.	40	14 years	Do. Do.	Do. ..	No improvement	
13	2706 / 1927-28	A. A.	45	20 years	Hypotonia. Ataxia. Pins and needles sensations. Vision diminished. Loss of jerks and deep sensation.	Anti-syphilitic treatment. Malarial attack, natural. Two injections of 1/40 gr. H. P. in 5 per cent. sol. in cisterna magna.	Clinically no improvement. Severe reaction, vision not improved.	The natural attack of malaria was of no benefit to the patient in any way. (Case No. 6.)
14	4477 / 1927-28	J. D.	50	20 years	Lightning pains in neck and face. Left ankle jerk absent. Vibration sense lost. Anæsthesia and hypotonia present.	Anti-syphilitic treatment. Injection of blood containing M. T. malarial parasites.	Marked change. Clinically cured.	When seen again after two years, the improvement was maintained. (Case No. 1.)
15	732 / 1928-29	J. M.	40	15 years	Patches of anæsthesia. Ataxia and dimness of vision. Ankle and knee-jerk absent.	Anti-syphilitic treatment. Injections of blood with B. T. parasites. Injections of B. T. and M. T. parasites cultured *in vitro*.	No change. No improvement in any signs or symptoms.	(Case No. 4.)
16	1874 / 1929	B. M.	35	10 years	Do. Do. Argyll-Robertson pupils present.	Anti-syphilitic treatment. Salvarsanized serum intrathecally and injections of B. T. and M. T. parasites cultured *in vitro*.	No change; slight reaction. No improvement in any clinical signs or symptoms.	Still under observation. (Case No. 5.)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

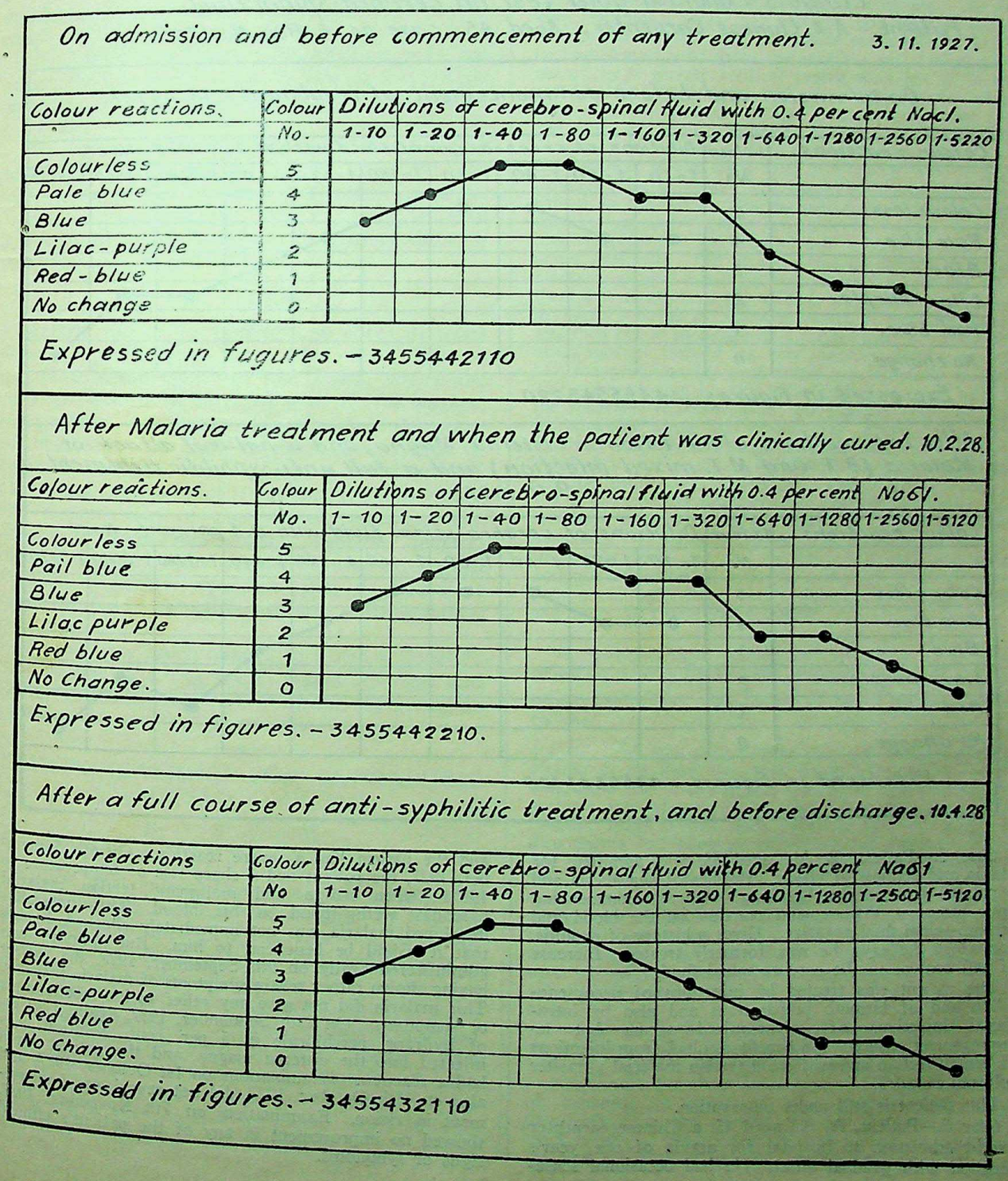
regions. From 13th October, 1925, he began to show some improvement in vision, which gradually improved first for light, then for white and other colours, then for figures, etc. When improved as regards his vision, he was discharged at his own request on 25th March, 1926.

On 30th November, 1926, the patient was admitted again, when he was stone blind and unable to walk. All jerks were absent. Testicular and deep sensations were completely lost. The muscular power in both right extremities was more diminished than in the left. He was gradually getting worse. On 11th December, 1926, he showed sudden signs of effusion in the chest, with distension of veins, and the glands on the right side hard and discrete. On 14th December, 1926, two pints of clear fluid were aspirated from the pleural cavity. On 15th December, 1926, the patient suddenly developed hemiplegia with aphasia. Every fortnight 2 to 3 pints of fluid had to be aspirated from the pleural cavity. On 15th March, 1927, the patient showed signs of effusion in the peritoneum and pericardium, and died on 1st April, 1927.

GRAPH 1.

Lange's colloidal gold test on Cerebro-spinal fluid.

Patient:- Mr. J.D. Aged. 50., Case no 1. Reg no. 4477.



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Case 4.—Patient, J. M., aged 40, admitted for ataxia and dimness of vision. Romberg's sign present. Gait tabetic. Sensations slightly impaired on the legs. Knee-jerks and ankle jerks absent. Fundi oculi showed primary optic atrophy. Wassermann reaction in blood and cerebro-spinal fluid, positive.

No improvement noticed after treatment by neo-arsenobillon and bismuth injections. On 20th May, 1929, 10 c.c. of blood containing *P. vivax* from a patient injected intramuscularly, but without any result. On 31st May, 1929, a culture of 48 hours old benign tertian malarial parasites was injected intramuscularly, and on 19th July, 1929, a culture of 72 hours old malignant tertian malarial parasites was also injected, but absolutely without any effect. Even after six weeks the patient has as yet shown no improvement.

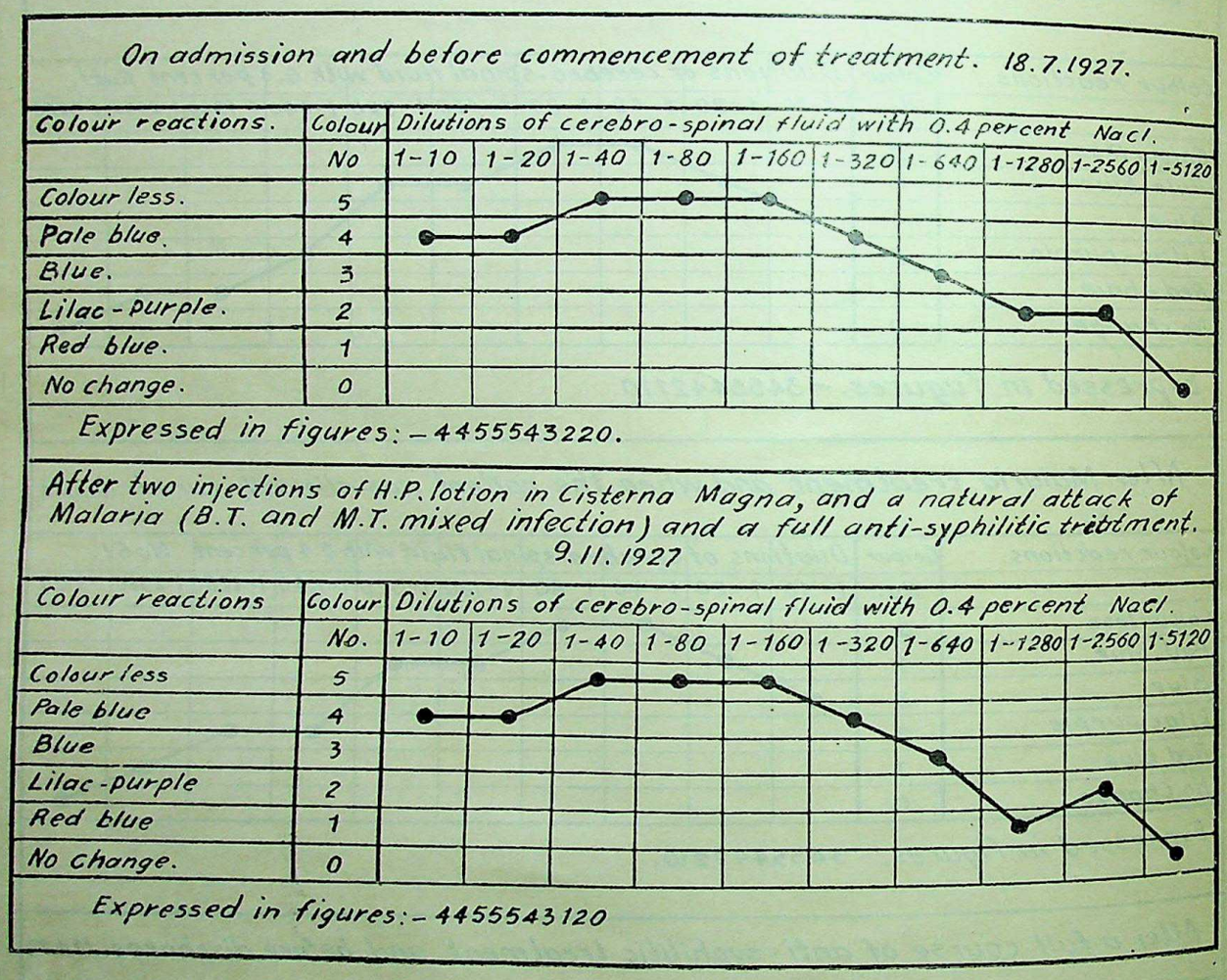
tion of pins and needles in the feet. Gradual diminution of vision. Argyll-Robertson pupils seen in both eyes. Cutaneous sensations diminished on the inner side of the feet and legs. Deep sensations lost in the calf muscles, eyeballs and testicles. Romberg's sign present. Gait tabetic. Knee-jerks and ankle jerks absent. Hypotonia and incoordination present. Wassermann reaction on blood and cerebro-spinal fluid, positive. Lange's colloidal gold reactions shows a tabetic curve.

The patient was given six neoarsenobillon and two silver salvarsan injections, mercury inunctions and potassium iodide orally, but no improvement was seen. On 2nd September, 1927, he had a slight rise of temperature but no malarial parasites were found in blood. On 4th September, 1927, 1|40 gr. of hydrarg. perchloride in 5 per cent. solution was injected into the cisterna magna,

GRAPH 2.

Lange's colloidal gold test on cerebro-spinal fluid.

Patient:- A.A. Chinese Carpenter, Aged 45, case no. 6. Reg. No 2706.



Case 5.—Patient, B. M., aged 35, was admitted for ataxia and dimness of vision. Patches of anæsthesia and hypotonia present, also Romberg's sign and commencing optic atrophy. Wassermann reaction on the blood and cerebro-spinal fluid negative. Gives a history of syphilis, for which, he says, he was formerly treated. Increase of cell content in the cerebro-spinal fluid.

The patient was treated by injections of neoarsenobillon and of bismuth preparations and also by intrathecal injections of salvarsanized serum but no improvement ensued. No benefit resulted from injections of benign tertian and malignant tertian malarial parasites cultured *in vitro*.

This patient is still under observation.

Case 6.—Patient, A. A., aged 45, a Chinese carpenter sought admission to hospital for ataxia of one year's duration with gradual onset. He had occasional sensa-

and the patient had a severe reaction. On 6th September, 1927, the patient had a sharp rise of temperature to 105°F. when benign and malignant tertian malarial parasites were found in his blood. This naturally-developed malaria was not immediately checked, hoping that it would be beneficial to him. But quinine was administered orally on 9th September, 1927, the patient having shown rather severe symptoms of malaria that day. This malaria did not give any relief to his tabetic signs or symptoms. On 25th September, 1927, again, 1|40 gr. of hydrarg. perchloride in 5 per cent. solution was injected into the cisterna magna, and the patient again had a reaction. Examinations on 1st October, 1927, and also on 18th October, 1927, did not reveal any improvement in vision. Examination on 7th November, 1927, showed no improvement in any of the patient's clinical signs or symptoms.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SUMMARY.

(1) Patients in Bombay appear to have acquired a certain amount of resistance to malaria infection, and hence cannot be infected by injections of blood from persons containing *P. vivax*.

(2) In our cases, injections of malarial parasites cultured *in vitro* produced no improvement of any kind.

(3) Malaria acquired in the natural way, while in the hospital, did not improve one patient's condition.

(4) In order to induce malaria and secure its therapeutic advantage, the patients had to be injected with fresh blood containing *P. falciparum*.

(5) Treatment by the usual anti-syphilitic measures did not result in any clinical improvement.

(6) Lange's colloidal gold reaction was not materially influenced either by the anti-syphilitic measures or other malaria therapy (*vide* graphs 1 and 2).

(7) Injections of hydrarg. perchloride lotion into the cisterna magna in one case did not improve the patient's vision or any other symptom.

(8) Effusion into the pleural cavity in case 3, developed suddenly without the patient showing any symptoms at all.

CONCLUSIONS.

Malaria therapy is beneficial in cases of tabes dorsalis, particularly the early ones. But in malaria-infected countries like India, where the patients have to be infected with *P. falciparum*, the problem becomes a difficult one. As some of these cases are likely to show severe signs of cerebral malaria, necessitating a constant and alert watch, and prompt treatment, the importance and responsibility of this line of treatment, can never be over-emphasized. As the malaria therapy does not influence the positive serological findings, it seems imperative that it should be supplemented by the usual anti-syphilitic measures.

We are very much obliged to Lieut.-Colonel S. S. Vazifdar, M.R.C.S., I.M.S., Superintendent and Senior Physician, Sir J. J. Hospital, for giving us facilities to carry out these observations.

THE INDICATIONS FOR SUPRAPUBIC CYSTOTOMY.

By A. N. GHOSE,
Officiating Civil Surgeon, Tippera.

SINCE the introduction of litholapaxy by Bigelow, and its modifications in India by Freyer, the suprapubic operation has fallen largely into disuse. Litholapaxy in hands accustomed to it is no doubt an excellent operation. But in *mofussil* towns of Bengal where one comes across stone cases only occasionally it is not always a safe and desirable operation even in expert hands. The instruments too are likely to deteriorate. I have seen a case of perforation of bladder in the hands of a very capable operator when he was operating with an old lithotrite. Of course immediate suprapubic lithotomy was done and the patient made an uninterrupted recovery. On the other hand, suprapubic cystotomy is very easy to do, requires no special instruments, can be done in ordinary *mofussil* towns by surgeons of ordinary skill, complete removal of stone or any other foreign body is ensured, and the condition of the bladder wall can be definitely ascertained. Of course the convalescence is a little prolonged. The operation can also be undertaken with less danger in debilitated patients with cystitis, the type of cases we meet with in the *mofussil*.

The following case will illustrate this:—

Case 1.—A Hindu male, aged about 46, came to the outdoor department of the Comilla Hospital with the distinctive gait of pain in the lower abdomen. He was very emaciated, weak and anæmic. He gave a history of gonorrhœa. He said that about seven months before he had retention of urine for which a soft catheter was passed by a private medical practitioner, but as it was an old catheter a fragment of it was left behind. A few days after, he said, the broken fragment came out with the flow of urine. Burning during micturation and frequency of urination began shortly after that. On examination of the chest râles and ronchi were present on both sides of chest. The suspicion of stone was confirmed by the sound. But the patient was so very weak that it was not thought advisable to operate on him immediately. He was treated with urotropine, laxatives and a milk diet. But as there was no definite improvement of general health, it was decided to operate. As there was stricture of the urethra, the urethra was dilated by Lister's bougies. About 6 ounces of sterilized saline was then put in by means of a metal catheter. After the usual median incision the recti muscles were separated and the posterior layer of fascia was carefully incised. The subperitonial fat was then pushed up, and with it the reflection of peritoneum; the bladder, recognized by its muscular fibres and bluish grey colour, was then fixed by two sutures high up, and was incised. Two horse-shoe shaped stones were removed by stone forceps and the bladder was drained by a syphon arrangement.

The patient was much relieved, but the bronchitis was definitely increased and he began to expectorate large quantities of purulent sputum. A mixture of oil of eucalyptus, tinct. benzoini co., tinct. belladona and rum, and an inhalation of creosote and eucalyptus oil were then prescribed. In a week's time he was much better and there was no further trouble.

It will perhaps be not out of place to give a brief summary of two other cases in which suprapubic cystotomy was found to be of great service to me.

Case 2.—I was called in to see a respectable retired pleader of the local Bar, aged about 70 years, for retention of urine. I found the case to be one of enlarged prostate and relieved the bladder. A month later (13th August, 1928), I was again called in and was told that instruments had been passed before my arrival without any success. As there was much bleeding on the slightest attempt to pass a prostatic catheter I advised him to come into hospital for suprapubic cystotomy, which I carried out immediately. Drainage of the bladder was continued for about one month. As the abdominal wound was healing up he began to pass small quantities of urine through the natural passage and by the fourth week of September 1928, he had no difficulty in passing urine.

Case 3.—A Hindu, head constable, aged about 40 years, attended the Sadar Hospital with retention of urine on 17th March, 1928. He had been suffering from stricture of the urethra for about seven years. He gave a history of retention of urine on one occasion two years previously. On the present occasion instruments were tried by several private practitioners without any success. I found on examination that several false passages had

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

been made. I, therefore, thought it better to drain the bladder after suprapubic cystotomy in preference to the Wheelhouse operation. After two weeks the urethra was gradually dilated and the patient made an uneventful recovery.

I may here mention that I always drain the bladder after the suprapubic operation by stitching the walls of the bladder to the abdominal wall and in my opinion this procedure leads to better results than the so-called ideal operation of closing the bladder wall.

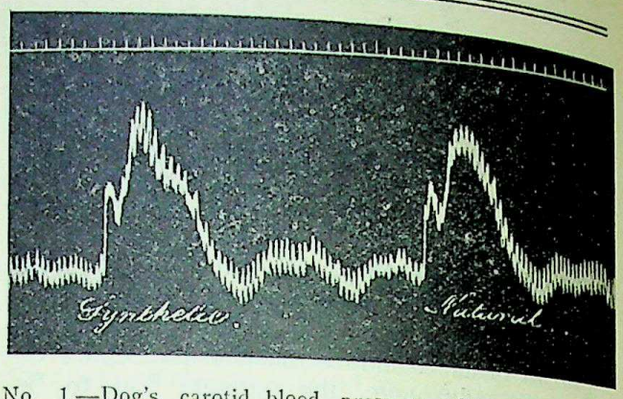
A NOTE ON THE ACTION OF SYNTHETIC ADRENALINE.

By A. S. PARANJPE, M.B., CH.B. (Edin.), M.D. (Heidelberg), D.T.M. (Lond.),

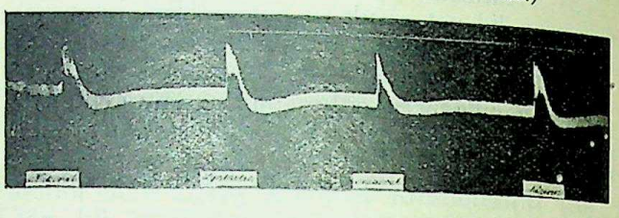
Professor of Pharmacology and Materia Medica, Seth G. S. Medical College and King Edward Memorial Hospital, Bombay.

ADRENALINE was the first of the "hormones" to be separated in a state of purity and it is the only one included in the current edition of the British Pharmacopœia. It was first isolated from the suprarenal gland by Abel and Crawford (1897) and Takamine first obtained it in a crystalline form. Adrenaline was also the first of the hormones to be synthetised; the synthesis has been attempted in many ways but the method of Scholtz patented by the Farbwerke vorm. Meister, Lucius and Bruning (1904) gives the best results (Linnel, 1928). The synthesis of the racemic compound was first accomplished, but now the same firm has put on the market the synthetic L-rotatory adrenaline under the name of "Suprarenin Synth." along with their natural "Suprarenin."

Recently there was a complaint in our hospital about the efficiency of certain brands or samples of adrenaline in use and so all of them, "good" and "bad," were sent to this department to be tested. The ordinary method biological standardization was used, but, instead of a standard, fresh samples of adrenaline of certain reputed manufacturers were obtained from the local agents and used for the comparison. The method is based on the fact that if in an animal the same quantity of adrenaline is injected several times in succession the rise in blood pressure caused by each injection is about the same (Storm van Leeuven, 1923). Burn (1928) recommends the cat as a suitable animal, but Pittenger (1928) prefers dogs; the latter were used here being the most easily available animals. Several tracings were taken, after the injection (into the femoral vein) or each sample in every animal, and compared. Since the "Suprarenin Synth." was one of the samples referred to us from the hospital, it was also tested along with others and found to be equal to the best samples of natural adrenaline of the same and other manufacturers. A few of the carotid blood pressure tracings are given below:—



No. 1.—Dog's carotid blood pressure after intravenous injection of equal doses of synthetic and natural adrenaline or "suprarenin." (Time marking: 10 secs.)



No. 2.—Comparative effects after intravenous injection of equal doses of different brands of adrenaline on carotid blood pressure of dog. (Time marking: 10 secs.)

The original synthetic (racemic) D-L-isomer was found to be nearly half as strongly vaso-constrictor as the natural by Cushny (1926). Hence, certain statements like the following:—"Natural adrenaline is L-rotatory, synthetic adrenaline is optically inactive and has only about half the toxicity of the natural variety because it is a mixture of stereo-isomers" (Dixon, 125), have created the impression among the students and practitioners that a L-rotatory adrenaline, identical with the natural base, has not yet been synthetically prepared, or, at least, is not on the market, and they hesitate to use it, if such a preparation is offered to them. The results of the tests at this laboratory have therefore been published. They show only the hæmodyamic action due to its action on blood vessels after intravenous injection, but there are reports of its efficiency as a vaso-constrictor when applied to mucous membranes (Kraupa, 1928) and used with anæsthetics (Fuler).

It is claimed that the synthetic L-adrenaline possesses certain advantages over its natural isomer. It is said to be more uniform and free from impurities, therefore it can keep longer. All this is obvious from its method of preparation and source; and it is hoped that the next edition of the B. P. will include also the synthetic product (Bennet, 1928).

REFERENCES.

Bennet (1928). Chairman's address at British Pharmaceutical Conference. *Quart. Journ. Pharm.*, I.
Burn (1928). *Methods of Biological Assay.*
Cushny (1926). *Biological Relations of Optically Isomeric Substances.* Ballière, Tindall and Cox.
Dixon (1925). *Manual of Pharmacology.*
Kraupa (1928). *Medizin. Klinik.* 36.
Linnel (1928). *Quart. Journ. Pharm.*, I, p. 562.
Pittenger (1928). *Biologic Assays*, pp. 61—72.
Storm van Leeuven (1923). *Adberhalden's Hündbuch der Biolog. Arbeitsmethoden*, Abt. IV, Teil 7, Heft 5.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

WERTHEIM SCHANTA'S INTERPOSITION OPERATION FOR COMPLETE PROLAPSE OF THE UTERUS.

By CAPTAIN D. H. VARIAVA,
Acting Chief Medical Officer, Nawanagar State, Jamnagar.

THE interposition operation for complete prolapse of the uterus consists in bringing out the uterus through the anterior vaginal coleotomy incision and placing it between the base of the bladder and the anterior vaginal wall. This paper is based on five operations that have been performed for complete prolapse of the uterus by the author at Jamnagar State Hospital, during the last three months. Of these, four were interposition operations, and one was a complete vaginal hysterectomy, as there was incipient cancer of the cervix. All the five operations have proved quite successful and the conditions have been cured. The author has seen very gratifying results from these operations in Vienna hospitals and especially at the clinic of Professor Kermauner, the successor of Wertheim.

Before describing the technique of the operation, certain anatomical and ætiological factors in prolapse of the uterus will be described.

Normally the uterus is held in position by a suspensory mechanism and supporting mechanism. The former consists of endopelvic fascia, sacro-uterine ligaments, round ligaments and broad ligaments, and is chiefly concerned in the normal anteverted position of the uterus in relation to the rectum and bladder. The fibrous portion of the endopelvic fascia round the cervix and running from it to the back and front of the pelvis is designated by E. Martin as the retinaculum uteri, and according to him anomalies of the suspensory mechanism are chiefly concerned in prolapse of the uterus. On the other hand, Halban and Tandler maintain that the anomalies of the supporting apparatus are all-important in the production of prolapse. The chief supporting mechanism consists of the diaphragma pelvis-rectal (levator ani) and diaphragma urogenital. The levator ani forms the chief part of the former and is the main support of the uterus. Its anterior fibres, arising from the back of the pubis, run backward along the sides of the urethra, the base of the bladder and vagina, and passing behind the latter, some of the fibres are inserted in the anterior surface of the rectum just above the upper end of the anal canal and into the central tendon; the rest, passing by the sides of the rectum, are inserted into the median raphé and some into the anterior surface of the sacrum. This anterior portion of the muscle is designated the pubo-rectalis. The opening in the muscle, through which the vagina traverses, is compared by Halban and Tandler to a hernial ring; as long as the ring is small and well contracted, the uterus will remain inside the pelvis in spite of increased intra-abdominal pressure, but if this ring gets enlarged and lax from any cause, then the uterus will tend to come down, and prolapse will eventually occur. Again, if the uterus is abnormally small, as in senile atrophy, it may prolapse through a normal ring. According to Reifferscheid,—Wertheim, Jaschke, and Sellhaim think that both the suspensory and supporting mechanisms are concerned in the production of prolapse. Lately even Halban has stated that "without retroversion there is no descent, and without descent no prolapse."

Ætiology.—From the above considerations it is clear that increased intra-abdominal pressure with enlargement and laxity of the genital ring will cause prolapse of the uterus. The chief causes of prolapse are:—(1) Injury during childbirth due to a large head stretching and tearing the muscles of the pelvic diaphragm and ligaments. (2) Instrumental delivery causing trauma. (3) Infection causing inflammation of muscles and ligaments and destroying their elasticity and leading to atrophy. (4) Want of proper rest after delivery may lead to laxity of ligaments and muscles. (5) General asthenia after childbirth, or due to other diseases. (6) General visceroptosis may be accompanied by uteroptosis. (7) Spina bifida by causing destruction of the 3rd and 4th sacral nerves may lead to paralysis of the levator ani. (8) According to Hirsch certain work requiring constant sitting may cause disuse atrophy of the levator ani. (9) Increased intra-abdominal pressure, due to tumours or ascites. (10) Atrophy of the uterus at the climacteric or senile atrophy. The largest number of prolapses occur between the ages of 40 and 45, which coincides with the climacteric.

It is not necessary to describe the different degrees of prolapse, for the operation in question is most suitable for complete prolapse. Generally all the cases of prolapse seen in India are of long standing and there are one or more ulcers on the prolapsed mucous membrane of the vagina. By complete rest in bed in hospital and keeping the part clean and occasional touching with silver nitrate and pure carbolic acid, these ulcers heal completely, or if they do not heal completely, the granulations become quite healthy and clean, all discharge stops and in these cases the ulcer is excised completely at the time of operation.

The Technique of the Operation.—The bladder is completely emptied with a catheter just before the operation. The patient is put in the lithotomy position. Spirit biniodide and tincture of iodine are applied to the whole perineum and the prolapse; the anterior lip of the cervix is held with a vulsellum. A bladder sound is introduced into the bladder to ascertain the lower limit of the organ. A vertical incision is made in the middle of the anterior vaginal wall starting ½ inch below the opening of the urethra and running down to ¾ inch above the anterior lip of the cervix. The vaginal mucous membrane of the anterior vaginal wall is now dissected off from the wall of the prolapsed bladder on either side with a pair of flat curved scissors. Then the lower pole of the prolapsed bladder is dissected off from the elongated anterior surface of the body of the uterus, till the vesico-uterine fold of peritoneum is reached; this dissection is greatly facilitated by

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

pushing up the bladder with the index finger covered over with a piece of gauze. The fold of peritoneum is held with a forceps and is divided transversely; the anterior fold of the peritoneum is secured with a pair of artery forceps. This opens up the abdominal cavity through the vagina. Now a sharp hook or a toothed forceps is introduced into the abdominal cavity and the body of the uterus is hooked just above the peritoneal wound and is pulled downwards; a second hook is now introduced a little higher up till the fundus comes in sight. Thus hooked, the whole uterus is brought out through the peritoneal opening.

The anterior fold of the peritoneum is stitched to the posterior surface of the body of the uterus just above the internal os with interrupted catgut sutures, thus shutting off the peritoneal cavity from outside. Catgut sutures are now passed through the round ligament and the tubes near their origin and are secured on both sides to the levator ani muscle by the side of the base of the bladder. The vaginal mucous membrane of the anterior wall is now stitched over the uterus, which lies under the base of the prolapsed bladder and pushes it up. For this interrupted catgut sutures are used, care being taken to include a part of the anterior surface of the uterine wall in the sutures to secure the uterus firmly in its new position. Generally the uterus is atrophied and small, and to make the vaginal wall fit over it tightly long strips of the vaginal mucous membrane are cut off from both the flaps, the breadth of the cut strips depending upon the size of the uterus. After this the cervix automatically goes inside the vagina. If the posterior vaginal wall is still lax, then similar strips are removed from it and the cut borders are sutured together.

A 12 inches long strip of iodoform gauze is introduced into the vagina so as to cover the sutured surface and then the whole vagina is packed with sterile roller gauze so as to prevent any oozing in the new uterine bed. This is kept in for 24 to 48 hours. Subsequently only a small strip of iodoform gauze is introduced into the vagina and a pad applied outside. Throughout the operation only catgut is used. The patient is generally allowed to sit up on the 8th day and can walk about on the 15th day and can be discharged after that.

It is evident that the most important step in the operation is the anterior vaginal coleotomy. If the plane of the vesico-uterine fascia is not entered while separating the bladder from the body of the uterus, the vesico-uterine peritoneal fold will not be found. If the dissection is too superficial then the bladder may be punctured or cut into, which will be a tragedy; if too deep the uterine muscles will be cut and there will be bleeding. If the proper plane is entered then the two organs will be very easily separated without any loss of blood, and the peritoneal fold will be very quickly and easily reached.

Later Wertheim further modified the operation by fixing the anterior portion of the cervix to the sacro-uterine ligaments through a posterior colpo-coleotomy. But according to Doderlein this step is not essential, except in very rare cases.

In women of child bearing age, sterilization should be performed by cutting off a piece of tube on both sides and closing up the cut ends. Wertheim had 93 per cent. of permanent cures and others had between 70 and 80 per cent. According to Reifferschied, the operation mortality is between 3.4 to 7.5 per cent. and due generally to secondary hæmorrhage in the extensive wound surface, suppuration or thrombosis.

As far as is known, this operation is very rarely performed in India, and in view of its good permanent results and safety, it is pleaded that this method of operation should be more extensively practised in the treatment of prolapse of the uterus. Incidentally it may be urged that vaginal coleotomy should more extensively be practised in gynæcology as entailing less shock, whilst in a country like India where abdominal laparotomy is still dreaded, more patients will submit to operations if this route is used.

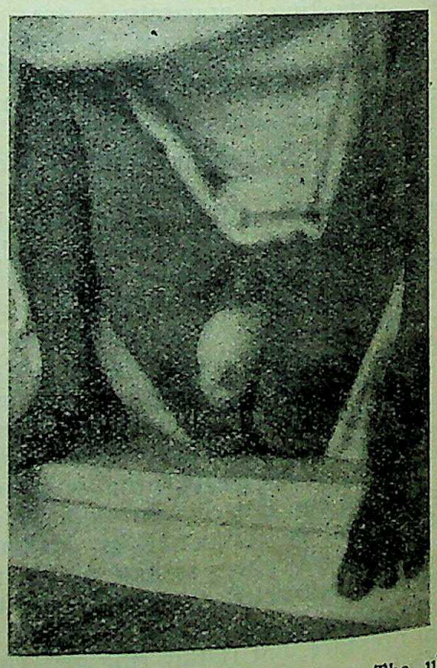
Short Case Histories.

Case I.—Mrs. K. N., Mahommedan. Admitted on 14th April, 1929. Age 70 years. Complete prolapse with extensive ulceration on the right side of vaginal wall. Ulcers took a long time to heal. Interposition operation performed on 13th June, 1929. Also posterior colporrhaphy performed. Discharged cured 3rd July, 1929.

Case II.—Mrs. J. K., Hindu. Admitted on 8th July, 1929. Age 60. Complete prolapse. Slight inflammation of cervix. Interposition operation performed on 16th July, 1929. Discharged cured 7th August, 1929.

Case III.—Mrs. F. D., Mahommedan. Admitted on 24th July, 1929. Age 50 years. Complete prolapse with cancerous ulcer on the posterior lip of the cervix. Total vaginal hysterectomy performed on 30th July, 1929. Discharged cured 20th August, 1929.

Case IV.—Mrs. M. T., Hindu. Admitted on 28th June, 1929. Age 60. Complete prolapse and extensive



Case IV. Complete prolapse of uterus. The ulcer on vaginal wall is very well seen. It was excised completely at operation.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ulceration of the cervix and vaginal wall. Ulcers took a long time to heal; one ulcer ½ inch diameter did not heal. Interposition operation done on 17th August, 1929. Ulcer completely excised. Posterior colporrhaphy performed. Complete recovery. Patient will shortly be discharged.

Case V.—Mrs. A. N., Mahommedan. Admitted on 7th August, 1929. Age 50. Complete prolapse with ulcer on the posterior lip of the cervix. Interposition operation done on 24th August, 1929. Ulcer completely excised. Complete recovery. Patient will be discharged shortly.

The common feature of all the cases are ages between 50 and 70. All had ulcerations which generally cleared up rather quickly. In all, the recovery was complete and uneventful.

CONCLUSIONS.

(1) The cause of prolapse is due to anomalies of both suspensory and supporting mechanisms.

(2) The interposition operation, based on anatomical findings, cures the condition permanently in more than 90 per cent. of cases.

(3) Cystocele is very effectively cured.

(4) The vagina is restored and the cervix lies almost in its normal position.

(5) If the patient is still menstruating then the discharge can come out by the normal route.

(6) The risk of sepsis and the operative mortality are very low.

REFERENCES.

Halban. *Seitz Biologie und Pathologie des Weibes*, Vol. III.

Döderlein. *Krönig Operative Gynakologie.*

Victor Panchet. *Practical Surgery, Illustrated*, Vol. VI.

(*Note.*—We have shown the above article to Lieut.-Col. V. B. Green-Armytage, M.D., F.R.C.P., I.M.S., Professor of Midwifery and Gynæcology, Calcutta Medical College, who writes as follows:—

This article is a very welcome contribution on a condition which is present in almost 50 per cent. of Indian multiparæ. The operation described is the one that has been regularly performed in the Eden Hospital, Calcutta, for the last five years with excellent results. The only difference is the name that has been attached to the operation, for there has been much discussion in the gynæcological press as to priority of description. Twenty-five years ago Duhressen wrote up an operation which was very similar, but we think that the first independent illustrated account of the technique used was given by Watkins of Chicago, and therefore to him the credit is given as a rule, though, of course, Wertheim may have independently evolved it on the Continent about the same time. Anyhow, among English-speaking gynæcologists, the American is given the palm of priority.

We are convinced that it is the ideal operation for India, as it is not accompanied by shock or great bleeding, as is the Fothergill or Manchester school operation; and our experience of over one hundred operations amply confirms that of Dr. Variava. There is, however, just one small criticism to make, and that is that as the operation is described, the posterior vaginal wall and the vaginal outlet must be left gaping, with or without a rectocele, as occurs in 75 per cent. of patients on this side of India. Therefore we always finish off the Watkins' technique by doing a high posterior colpo-perineorrhaphy as a routine.—EDITOR, *I. M. G.*).

THE SUCCESSFUL USE OF A TUBERCULOUS METHYLIC ANTIGEN IN EXTERNAL TUBERCULOSIS.

By MAJOR V. LABERNADIE, M.D., M.S.P.E. (Paris),
and
MEDICAL OFFICER ANDRE ZEGANADIN, M.S.M.H.T. (Paris),
Chief and Assistant of the Research Laboratory of Researches, Pondicherry (French India).

FOR numerous practitioners, the question of the cure of tuberculosis by specific agents is not yet solved. There were too many deceptions with the use of tuberculin, and many doctors have come back to the older and more prudent methods which reinforced the means of defence of the organism by chemical or physical agents. Research workers, however, have never lost the hope of curing tuberculosis by the corresponding bacilli or by their more or less modified extracts.

Among the recent methods of treatment, it may be useful to point out the good effects of the methylic antigen prepared by Boquet and Negre, at the Pasteur Institute of Paris.* This method is very simple and can be easily controlled; it deserves to be adopted as a routine, in hospitals as well as in general practice—at least in external tuberculosis.

The product is obtained by the maceration of tubercle bacilli in methylic alcohol and filtration. (1) This extract is used at first diluted at 1 : 10, by subcutaneous injection, at a dose of 0.25 c.c. The rectal temperature must be taken carefully twice a day. A little feverish reaction is common, and the following injection should be given only when this reaction is over. In general, two injections may be made weekly. In case of a strong reaction, the dose should not be increased, if the reaction has been weak, the dose is increased by 0.25 c.c. (that is to say 0.50, to 0.75 c.c.). One arrives in this way after 4, 6, or 8 injections at a dose of 1 c.c., which is then repeated several times.

Pure antigen (not methylic) must then be used. The doses are given in a similar way of progression, say from 0.25 to 1 c.c. But here, the temperature and the general condition must be very carefully observed. A stronger dose should be given only if the feverish reaction has been very slight. On the contrary, if the reaction has been marked, the same dose should be repeated till the patient keeps a normal temperature.

It is according to this method that we have treated the following patients:—

Case 1.—Tang, male, aged 30. Cervical cold abscess (on the right side) of the size of a pigeon's egg. Received 19 injections of methyl antigen from 15th December, 1927 to 19th November, 1928. Practically cured.

Case 2.—Ant, male, aged 20. Cervical cold abscess (right side). Received 14 injections of methyl antigen from the 1st November, 1928 to 26th March, 1928. Practically cured.

Case 3.—R. And, male, aged 31. Sterno-clavicular arthritis (left side) with fistula. Received 19 injections

* The Pasteur Institute supplies 1 c.c. phials of methyl antigen, pure or diluted.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of methyl antigen from 12th November, 1928 to 1st May, 1928. Fistula closed up, arthritis practically cured.

Case 4.—Mar., male, aged 46. Sterno-clavicular arthritis (right side). Received 15 injections of methyl antigen from 23rd March, 1928 to 18th May, 1928. Practically cured.

Case 5.—Can., female, aged 27. Submaxillary lymphadenitis (right side). Received 23 injections from 18th May, 1928 to 15th August, 1928, on which date she left us of her own accord, the volume of the lymph-nodes having come back almost to the normal.

Case 6.—P. Laz., male, aged 17. Coxo-femoral arthritis (right side) with impossibility of walking, patient bed-ridden for one month. Received 30 injections of methyl antigen from 16th June, 1928 to 21st September, 1928. The patient left us of his own accord, not cured, but very much improved, walking with a stick.

Case 7.—Ratt., female, aged 9. Cervical lymphadenitis (left side). Received 15 injections of methyl antigen from 15th July, 1928 to 13th August, 1928. Practically cured.

Case 8.—Vall., female, aged 30. Submaxillary lymphadenitis (right side). Received 17 injections of methyl antigen from 30th July, 1928 to 10th October, 1928. She left us of her own accord, the volume of the lymph-nodes having come back almost to the normal.

Case 9.—Rang., male, aged 45. Sterno-clavicular arthritis (left side). Received 23 injections of methyl antigen from 31st July, 1928 to 1st November, 1928. Practically cured.

Case 10.—Ratt., male, aged 40. Cervical cold abscess (right side) with fistula and sterno-clavicular arthritis. Received 22 injections of methyl antigen from 7th August, 1928 to 1st November, 1928. Abscess and fistula closed up, arthritis practically cured.

Case 11.—Sey. Al., male, aged 16. Tumor albus of the left knee joint. Received 24 injections of methyl antigen from 24th September, 1928 to 29th December, 1928. At that date the patient walked easily and could be considered as practically cured.

Case 12.—Gov., male, aged 50. Cold abscess of the left axilla with fistula. Received 14 injections of methyl antigen from 2nd August, 1928. On the 1st October he is continuing the treatment and he is already much better.

A Mirror of Hospital Practice.

A CASE OF IRREDUCIBLE HERNIA RELIEVED BY ATROPINE SULPHATE.

By D. V. PRADHAN, M.B., B.S.,

Shahapur, District Thana.

I WAS called to a neighbouring village to see a patient with severe abdominal pain and vomiting. On examination I found it was a case of strangulated inguinal hernia (left side). The patient had lifted a heavy stone ball that morning in order to give an exhibition of his strength. The swelling in the scrotum was very tense. I tried taxis without success. The patient was too poor to go anywhere for surgical relief. I immediately remembered having read in the *Indian Medical Gazette* about the successful employment of atropine sulphate in a similar case, so at once I gave 1|100 gr. atropine sulphate subcutaneously. Within 15 minutes the whole descended gut suddenly returned to the abdominal cavity without any external manipulation. The patient felt prompt relief. The same man again had a similar trouble. This time he had carried two big tins of water from a well. I tried taxis, but it was not successful. So I gave 1|100 gr. atropine sulphate. This time it took nearly 30 minutes to act, but the gut returned to the general peritoneal cavity without any external manipulation.

I think atropine sulphate should be given a trial in every case of the above mentioned type in the early stage before sending the patient for operation.

A CASE OF URTICARIA.

By S. M. HUSAIN, B.SC., M.B., B.S.,

Tibbyia College, Muslim University, Aligarh.

A FEMALE patient, aged 20 years, consulted me about the urticarial attacks from which she had been suffering for the last three months. She had tried other treatment, but with no relief. I started to find the cause which was responsible for her condition. Her diet, habits, clothing, all received careful consideration. She was put on milk diet, and then on *dal*, rice and curd, but with no change in her condition. After a few experiments of this nature it became obvious that no article of diet was responsible for it. There was nothing wrong with her habits, dress, or environment. Failing to find a cause, palliative measures were resorted to with only temporary and incomplete relief, among which was a daily warm saline bath. This last seemed to do her good. The wheals decreased in number and size as well as in duration. But every third or fourth day a fresh crop would appear which coincided with the use of soap. The use of the soap was discontinued, and then she was asked to change her soap. When after two weeks' complete freedom she was asked, as an experiment, to use her original soap, she again got an attack. It is now over six months after the change of soap and she has remained perfectly healthy. It was a mere chance that led to the discovery of the cause.

In this particular case it was that excellent soap "Life-buoy," which is said to contain 1 per cent. carbolic acid, to which the patient was sensitive.

A CASE OF RAYNAUD'S DISEASE.

By A. P. BAJPAYEE, M.B., B.S.,

MacLaren Leper Hospital, Dehra Dun, United Provinces.

RAYNAUD'S disease is so rarely met with in the tropics that it will be of interest to record the following case for the benefit of general practitioners and those medical men who are working in leprosy.

The case was sent to Dehra Dun from Etawah as a suspected case of leprosy, which it simulated on account of the dropped-off toes. But for that solitary sign there was no other sign or symptom of leprosy. The illustrations (Figs. 1 and 2) show the condition of the patient.

R. K., æt. 38 years, came over from Etawah to the MacLaren Leper Hospital, Dehra Dun, on the 16th July, 1929, complaining of severe burning pain in the ulcerating toes, the soles of the feet and legs for the last eight months.

History of present illness: At the end of October 1928, the patient had a rise of temperature associated with slight shivering and pains in his feet; the temperature became normal in a day without treatment. Four or five days later he got drenched in the rains and he continued wearing the shoes which remained wet and cold for four or five days. At the end of this period he

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

noticed a dull pain in both the feet; this pain got worse one day; so he consulted a hakim who gave him purgatives to be taken thrice on alternate days. He felt relief after the first two doses, but the pain again grew worse on taking the third dose of the purgative on the fifth day. The pain was so intense that he could not get any sleep for twenty-four days. Local applications of lead lotion with opium and hypodermic injections of morphia gave him only a little relief. Then hot fomentations with a heated mixture of cow's urine and nux vomica seeds were applied as advised by a vaid to the satisfactory relief of the patient; but after twenty-two days he found his toes were hard and black. Some local application gave rise to blister formation, resulting later in ulcerations.

Fig. 1.

The toes were dressed daily till, at the end of three months, the distal halves of all the toes except the left great toe fell off. This dropping off of the toes gave rise to anxiety and he consulted all classes of medical men who all suspected the condition to be leprotic. A vaid applied leeches to his heels and to his index and middle fingers of the right hand, where there was severe pain and swelling, in the month of April 1929. This treatment gave relief to the pain, but the ulceration did not improve; at last on the advice of the civil surgeon, he came over to Dehra Dun.

Present condition: All the toes except the left great toe have ulcerated stumps which are hyperæsthesic. Left foot swollen. Burning pains in the soles and heels of the feet where there are numerous ecchymotic patches. There is no patch of anæsthesia, erythema or depigmentation; no thickening of the great auricular, ulnar or external peroneal nerves; nasal swab "negative" to *Mycobacterium lepræ;* Wassermann reaction "negative" in all dilutions. The urine showed an appreciable quantity of albumen (2 grammes per litre), granular casts and pus cells, as well as diminished excretion of chlorides. The parts where the patient gets the burning sensation are cold to touch. Temperature, 102°F.

Discussion.—Raynaud's disease is a local arterial ischæmia, generally followed by asphyxia, occurring at the periphery of the circulation and producing symmetrically distributed gangrene of the skin and other tissues in the affected region. Symptoms usually appear after exposure to cold, often without any other symptoms except sleepiness. The most frequently attacked parts are the fingers, toes, tip of nose and ears. The phenomena is explainable by the spasm of arterioles due to central or peripheral influence on the sympathetic nervous system by the toxins absorbed most probably by the large bowel. The diagnostic features of the disease are coldness, lividity,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

spasmodic pains in the affected area, and symmetrical distribution, the last named being a significant and pathognomonic feature of the disease, as pointed out by Raynaud in 1862.

Diagnosis.—Excluding syphilitic endarteritis, diabetic gangrene and leprosy, the case was diagnosed as one of Raynaud's disease.

Treatment adopted.—On the hypothesis that very likely the toxin comes from the alimentary canal, Einhorn has succeeded in abolishing the symptoms of Raynaud's disease by administering large quantities of sterile normal saline (0.85 per cent.) sufficient to produce fluid motions. A light breakfast on waking followed two hours later by twenty-four ounces of the sterile saline daily was enough to produce four fluid motions in this case.

For the pain Atophan grs. xv twice a day for three days in a week was administered. The ulcers were aseptically dressed and almost all had

Fig. 2.

healed, except those in the three left toes, at the time he was transferred from here to Lucknow.

Hot dry fomentations were given to the soles and the heels, and the consumption of salt in the diet was controlled by the excretion of chlorides in the urine.

The following note on this case has been made by Lieut.-Col. G. T. Burke, I.M.S., Professor of Medicine, King George's Medical College, Lucknow.

"The condition of Raynaud's disease is so rare in a climate where severe cold is not usually experienced that it is necessary to be very sure of the diagnosis. In this case there does not seem to be any doubt. There is no history of hæmoglobinuria, which is sometimes associated, and only the toes are involved. There is the history of one attack, not going beyond the stage of asphyxia, affecting the index and middle finger of one hand. The lesions have now almost healed, and he has lost most of his pain under treatment by radiant heat. He may require some surgical trimming of the stumps eventually to do away with tender scars."

TWO CASES OF LEPROSY SUCCESSFULLY TREATED.

By L. N. MOHANTY,

Civil Sub-Assistant Surgeon, In-Charge Rajkumari Leper Asylum, Deoghar, Behar (India).

P. N., a young man of 32, a resident of Singhbhum district, was admitted on 26th July, 1928, for the treatment of leprosy. His condition before treatment was as follows:—

The case was one of the mixed variety; he had crooked fingers, a little thickening of the lobes of the ears in which leprosy bacilli were found, superficial anæsthesia of the legs almost up to the knees and of the forearms and hands all round, and swelling of the ankles. General health—poor, almost emaciated, and unable to do any work. No family history of contact, but he had been in prolonged contact with a leper in his village. Kahn's reaction was "doubtful."

He had suffered from no other diseases except leprosy, the duration of which was two years before treatment. Not unlike other lepers he was a sufferer from constipation and other bowel troubles. Purgatives were given for the removal of constipation and other bowel troubles One tube of neosalvarsan was injected in the course of treatment to make the "doubtful" Kahn reaction negative. The anti-leprosy treatment was potassium iodide orally and hydnocreol subcutaneously twice a week, doses 5 grs. to 240 grs., and 2 c.c. to 10 c.c., respectively, in gradation. Besides, chaulmoogra oil was given for inunction and trichloracetic acid was applied on the affected lesions. The two former medicines were administered alternately or in combination with each other as his general health allowed. When necessary rest from the treatment was given; tonic mixtures were also prescribed for the maintenance of his good health Sufficient good food including meat twice a month was his diet. The quantity of potassium iodide taken by him up till now is about 10 ozs. (240 grs. dose taken sixteen times) and the quantity of hydnocreol is 150 c.c. All the while, except during the first weeks, he was given some physical work to do, gradually increasing the labour hour. The length of treatment yet is only one year, during which he has suffered from a few moderate reactions. Almost from the beginning he showed marked improvement; the swelling at the ankles disappeared, the anæsthesia came down and is now practically *nil*, the crooked fingers became straight and the general health improved. On 22nd June, 1929, he was bacteriologically examined and found negative, both skin and mucous membrane. He is now almost cured as he still sustains no perceptible signs of leprosy and is fairly able to do any physical work, yet he is undergoing treatment for another period of six months before he will be finally discharged as cured.

Case 2.—Another youth of Manbhum district, S. P., aged 18, came here on 16th September, 1928, for the same purpose. He was purely of nerve variety, three small fingers of his left hand were contracted, peroneal nerves deeply affected, consequently he had drop foot and anæsthesia up to the knees, anæsthesia up to the elbow of his left hand, some depigmented and anæsthetic patches on upper arms and thighs, and septic ulcers on the right swollen foot. His general health was fair. He had contracted the disease from his own brother who is an infectious leper and with whom he had mixed intimately. The disease was of four years' duration; the contraction of the fingers appeared one year later. Malaria and constipation were his two main predisposing causes. The treatment was similar to that of the above. The first few months brought him little improvement, excepting the healing of the ulcers and the disappearance of the swelling of the right foot. Afterwards patches began to disappear and the anæsthesia lessened. A few weeks

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ago he showed me his fingers straight. The length of treatment up till now is only 10 months during which he has not suffered from any severe reactions. The amount of hydnocreol taken is 140 c.c., and potassium iodide is only 4 ozs. He is a regular physical worker, specially a carrier of water hanging from his fingers in buckets. This I think considerably helped the restoration of his crooked fingers. His diet was good, including milk, meat, vegetables, etc. Although he is now free from any active signs of leprosy yet he will do better for being treated for another period of six months, or more.

A CASE OF ENTERIC IN WHICH THE WIDAL REACTION BECAME POSITIVE ON THE 49TH DAY.

By RABINDRANATH CHATTERJEE, M.B.,

House-Physician, Medical College Hospitals, Calcutta.

J. L. B., Hindu, male, aged 30, was admitted into the Medical College Hospital on the 27th August last, as a case of enteric fever.

He came with a high continuous temperature which had continued for twenty-five days, and he gave a history of having passed two hæmorrhagic stools about four days before his admission into the hospital.

Condition on admission.—Temperature, 102°F.; pulse rate, 112; respirations, 26 per minute. The pulse was of fairly good volume and did not give any indication of internal hæmorrhage at the time. Tongue, coated and moist. Abdomen, slightly tympanitic, resonant all over, and not rigid. No enlargement of spleen and liver. Bowels constipated for about four days after the last two hæmorrhagic stools.

The case was clinically diagnosed as a case of enteric and the treatment was carried for this disease.

Just after his admission he was given a simple enema and as a result of which black (? altered blood) fluid was returned. The stool contained occult blood.

The Widal test was positive (1 in 25) to *B. typhosus* on the 2nd day after admission, negative on the 7th and 13th day, and again positive (1 in 500) to *B. typhosus* on the 24th day after admission (49th day of the disease). The blood culture was sterile on the 7th, 13th and 24th days and the urine culture on the 9th, 19th, and 23rd. No enteric group organisms were found in the stool, examined on the 9th day after admission.

The first Widal test, which was positive to *B. typhosus*, 1|25 only, was of no importance. The Widal being negative on the 38th day, we grew anxious as to the real causative factor of the temperature which now became more or less of an intermittent type. Still a negative Widal could only be explained by low body resistance, but we had to keep our minds open to other possible causes for the temperature. Mainly amongst others we thought of three things:—

(1) *B. coli* infection

(2) Kala-azar.

(3) Tuberculous affection.

Repeatedly negative results obtained with urine culture and a maintained alkalinity of urine, together with the failure of heavy doses of alkalies to control the temperature gave us some justification to exclude *B. coli* infection.

Next came the question of kala-azar. There was no progressive leucopenia, nor any enlargement of the spleen; and moreover Napier's and Chopra's tests were absolutely negative.

Thirdly, as to tuberculous affection of the lung. The chest was *x*-rayed, and a perfectly normal skiagram was received. Von Pirquet's cutaneous tuberculin test was done on the 14th September, 1929. The test showed a negative result. This negative result, as we know, has more distinct value, from a diagnostic point of view, over the positive result, which is often obtained in normal healthy individuals.

CONCLUSION.

The chief object of my publishing this case note is to record that that a positive Widal test, for the first time, was obtained as late as the 49th day of illness. It is little wonder that we were misled as to the diagnosis when the Widal was not positive until the 49th day. The patient became convalescent soon after the positive Widal reaction was found.

My thanks are due to Dr. B. L. Majumdar, Additional Physician, Medical College Hospitals, for kindly permitting me to publish these notes.

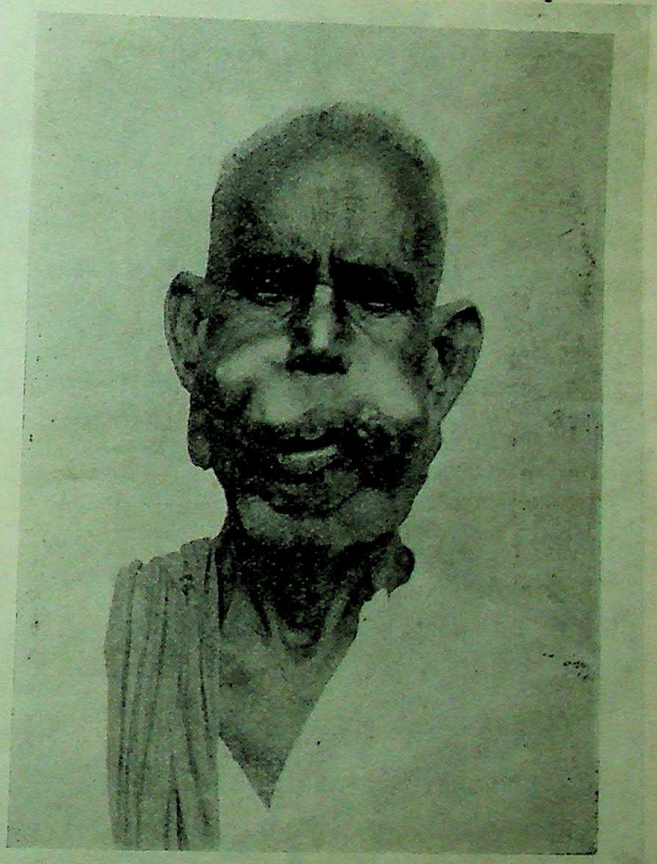
A CASE OF APHASIA DURING SPINAL ANÆSTHESIA.

By K. S. APPU MUDALIYAR AVL, M.B., B.S.,

Assistant District Medical Officer, East Godavari.

A HINDU male, aged 60, was admitted on 9th July, 1929, in the hospital as an in-patient.

History.—Noticed small cyst-like growths here and there on the face round the mouth which gradually increased in size and spread to the under-surface of chin. He was operated upon at



Vizagapatam 3 years back. The condition recurred.

Physical Examination.—Small tumours, cystic to feel, adherent to skin and deeper tissues, highly

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

vascular. A specimen was sent to the pathologist. The pathologist's report was "endotheloma of the face."

I have given spinal anæthesia a number of times, both here and at other places where I have worked. The method I have adopted is making a puncture at the 3rd or 4th lumbar space in the sitting posture, putting into the subdural space 2 c.c. of 2 per cent. glucose stovaine, and then making the patient lie flat on the table and breathe well. In about 10 minutes time complete anæsthesia up to the umbilicus can be obtained by holding the head down very carefully. As soon as anæsthesia of the required level was reached the patient was put in an inclining posture with head high. A screen was put in front of his face and during the operation some one engaged him in conversation. The last patient to whom I gave spinal anæsthesia was an adult man on whom radical hydrocele operation was done. This patient during operation suddenly developed a stammer in his speech, and later was not able to speak at all. His pulse and respiration were normal. For two hours after the operation he was still unable to articulate in spite of his attempts to do so. After two hours he suddenly developed the power of speech.

I have to thank the Superintendent of the hospital for allowing me to publish these records.

NAGA SORES IN GWALIOR.

By K. G. KHANDEHAR, M.B., B.S.,
Civil Hospital, Guna, Gwalior State.

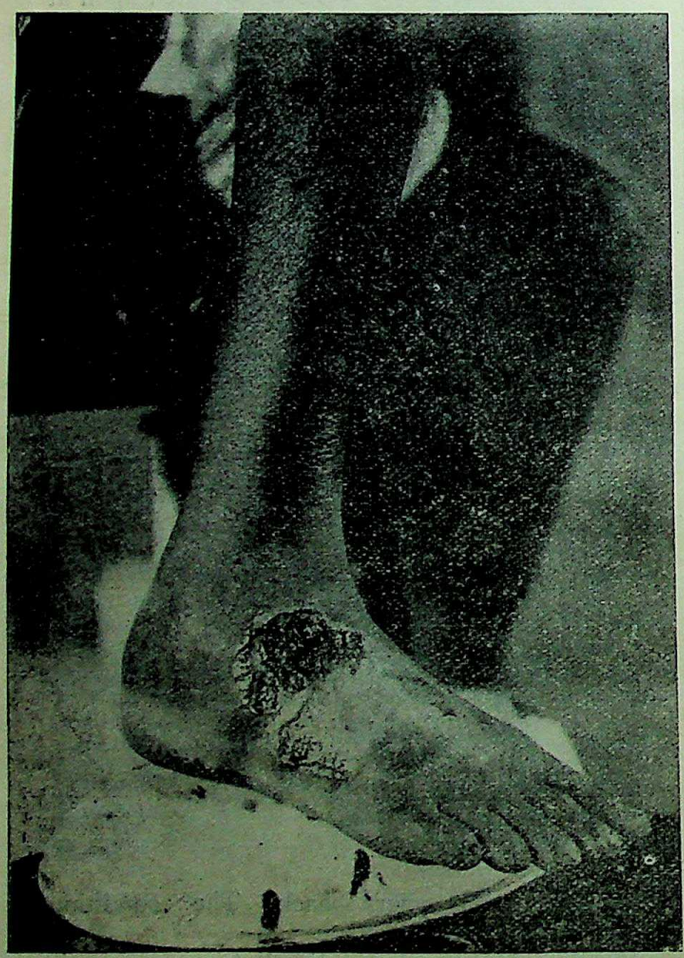
PRIOR to reading Dr. Roy's article on Naga sore in the *Indian Medical Gazette* of December 1928, my attention was drawn to two patients of this place by their having ulcers of unusual character on their legs. On reading the article I had no difficulty in settling the identity of the ulcers.

I am herewith appending photos of three cases. On microscopical examination of the exudate from these ulcers no spirochætes, fusiform bacilli, or diplococci could be found.

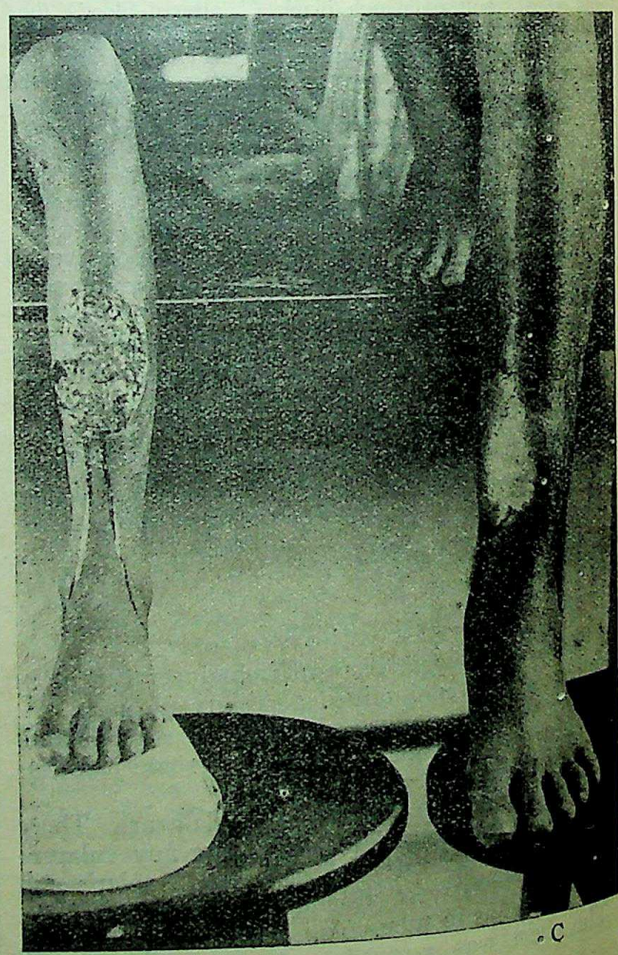
These ulcers are called "Gala" owing to the tissue-lysis that is produced, and are not entirely new to this part of the country, but have become common during the last two years, the years of bad harvests, and have evoked enquiries in the local paper. About 75 cases were treated in the Bhilsa Hospital and 15 in the Guna Hospital. Almost all the patients were in poor physical condition and about 50 per cent. had their spleen enlarged.

Excepting one poor clerk living in a village, all were villagers working in the fields.

The one thing noted was that even when the ulcers healed, leaving a good scar, the surrounding induration did not subside for a long time, (see photo C), and the affected limb was too painful to be used.



A



B

C

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Dangerous and Fraudulent Imitations.

Read this carefully. *Times of India.*

SKILFUL IMITATION OF PRODUCTS.

FRAUD ON CHEMICAL FIRMS.

Special to "Times of India."

PARIS, (By Mail)

So cleverly did a gang of fraudulent patents medicine vendors make up and sell quantities of faked medicines to chemists in Paris and elsewhere in France that the proprietors of the patent medicines themselves when asked by the police were unable to distinguish their own products from the faked ones.

The bottles, labels, printing and wrappings were all exactly imitated. Large shipments were made to Cuba and Mexico by deluded purchasers of the counterfeit medicines. Several arrests have been made but the police do not yet believe that they have caught all the men involved in the fraud which has cost reputable houses many thousands of pounds.

One of the cheated chemists with the connivance of the police set up a temporary export bureau and gave an order to the suspected persons. They duly delivered the falsified goods only to find themselves on arrival in the hands of the police.—British United Press.

SULFARSENOL AND ONLY GENUINE PACKING FOR INDIA

Imitations of SULFARSENOL of inferior quality having been put on the market by unscrupulous firms, we wish to warn our customers that we have adopted a special distinctive packing for India.

These fraudulent substitutes are unsuitable for tropical climates. They do not keep, losing their activity and becoming dangerous toxic drugs.

Insist on getting the only Genuine Package designed specially for your safeguard. It is in your own interest.

Note the only Genuine Package of

SULFARSENOL

Specially prepared for India and carrying the FULL GUARANTEE OF THE MANUFACTURERS.

If your chemist cannot supply the genuine SULFARSENOL, write to the

ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street,

P. O. Box 460, BOMBAY.

Warning.

Genuine SULFARSENOL in the genuine packing is the only guaranteed product and no other will be replaced in case of complaint.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"OPOCRINS"

Superior Gland Products.

Two Opocrins offer outstanding advantages as treatments of climacteric and other troubles.

Opocrin Ovaro-Adrenal Compound.

Ext. Ovary 7 ctgr.
Ext. Thyroid 2 ctgr.
Ext. Pituitary 3 ctgr.
Ext. Suprarenal 3 ctgr.
in each Opocrin

Opocrin Orchitic-Adrenal Compound.

Ext. Orchitic 7 ctgr.
Ext. Thyroid 2 ctgr.
Ext. Pituitary 3 ctgr.
Ext. Suprarenal 3 ctgr.
in each Opocrin

Dose Four to Eight "Opocrins" daily.

ONE GRAMME CREOSAL CONTAINS		
Guaiacol	48	centigrammes
Calcium	15	—
Phosphoric Acid	37	—

50 Centigrammes CREOSAL per tablespoonful
CALCIUM MONOGUAIACOL PHOSPHATE Chemically Pure

SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.
SYRUP CREOSAL A. F. D.

Coughs, Bronchitis, Influenza, Whooping Cough, Broncho-Pulmonary Affections.

CREOSAL A.F.D. has none of the inconveniences of Guaiacol; it has no odour or disagreeable taste and is readily taken by fastidious patients.

Send 8 As. stamps "for large sample bottle."

THE ANGLO-FRENCH DRUG CO. (Eastern), LTD.

Yusuf Buildings, Churchgate Street.

P. O. Box 460, BOMBAY — Telegrams: **P. O. Box 7861, CALCUTTA.**
P. O. Box 226, MADRAS — "AMPSALVAS." — **P. O. Box 134, RANGOON.**

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Indian Medical Gazette.

DECEMBER.

A NEW SUGGESTION IN MALARIA CONTROL.

THE rôle of Plasmochin in the treatment of malaria has been the subject of innumerable papers in the literature on tropical medicine during the last few years, and we do not propose to attempt here to summarise the findings with regard to it. Certain generally accepted facts, however, emerge from a study of this literature; (*a*) that plasmochin has a definitely destructive action on all phases of *P. vivax* infection; (*b*) that it has no destructive action on the schizogony cycle of *P. falciparum*, but has a markedly destructive action on the crescentic gametocytes of this species; (*c*) that the drug is not entirely safe for general use in outpatient departments, since its administration may be followed by abdominal colic, respiratory embarrassment and cyanosis,—whilst a few deaths have followed its use; it is therefore regarded in general as a drug for use only in well-controlled hospitals where patients are under continued and skilled observation. The position, in brief, may be summarised by saying that whilst plasmochin is an undoubted triumph for German synthetic chemistry, it is only a half-way house towards the ideal of a synthetic drug for the extirpation of malarial parasites in the human body, with no possibility of causing toxic symptoms in man, than the ideal cure itself. In this remedy we have rather a glimpse of future possibilities than a certain present-day utterly reliable and universal cure, such as the salvarsan derivatives present in the case of syphilis.

Yet there are possibilities with regard to plasmochin which, we believe, the medical profession in this country has as yet scarcely grasped. A recently published paper which may well become a classic in malariology is that by Barber, Komp, and Newman (1929). These authors began with the generally accepted view that plasmochin has a specially destructive action on the crescentic gametocytes of *P. falciparum*. Their special objective was to determine the minimal dose of plasmochin which would render these gametocytes incapable of developing in the mosquito, using *A. albimanus* as the test mosquito on account of its susceptibility to infection with the malaria parasites, and its eagerness to bite man. Laboratory-bred mosquitoes were used, were kept at room temperature under tropical conditions, and were dissected in general three days after the feed on the malaria carrier which served as donor of the infection.

A detailed description of the cases observed follows. These may be summarised as follows:—

Case 1.—European male, adult, aged 24, infected with *P. falciparum*. Received during three days after admission to hospital 54 grains of quinine sulphate in solution. Then showed 97 crescents per 1,000 leucocytes. Five mosquitoes fed at this stage on the patient gave 100 per cent. of oöcysts present.

This patient was now given 4 cgms. = ¾ grain of plasmochin on the fourth day in two equally divided doses. During the next three days crescents were abundantly present; 46 mosquitoes were fed on him during these three days, *and not one became infected.*

Case 2.—Negro-Spanish adult, male, infected with *P. falciparum*. Received 15 grains of quinine during the first three days after admission to hospital. During this period 16 out of 29 mosquitoes fed on him showed oöcysts on dissection. On the fourth day 1.5 cgms., or ¼ grain, of plasmochin was administered, and the 5 grains of quinine a day was continued. From the fourth to the seventh day 57 mosquitoes were fed on him, but *none became infected.* In the meantime crescents were always abundantly present.

Case 3.—West Indian negro with malignant tertian malaria. On admission there were 130 crescents per 1,000 leucocytes. A dose of 0.5 cgm., or 1/10 grain, of plasmochin was now administered. The next day no crescents were found in the films. Four out of 14 mosquitoes fed on the first day became infected, but *none out of 13 fed on the second day.*

Case 4.—A West Indian negress with malignant tertian malaria. On admission 196 crescents were present per 1,000 leucocytes. Of 14 mosquitoes fed on this day, 10 were found to contain oöcysts three days later. The patient was now given 10 grains of quinine daily plus 3 cgms. = ½ grain of plasmochin. On the third day of this treatment 16 mosquitoes were fed on her; *none became infected.*

Case 5.—West Indian negress, aged 14, admitted with malignant tertian malaria. On admission showed 26 crescents per 1,000 leucocytes. Of 13 mosquitoes fed at this stage on the patient, 10 became infected. Was treated with 11½ grs. of quinine a day plus 6 cgms. = 1 grain of plasmochin. Two days later 6 mosquitoes were fed on her, but *no infections resulted.*

Two further cases are cited, where, however, the blood was not examined or mosquito feeds made prior to plasmochin administration, but which gave similar results. The authors go on to write as follows:—"The results of these experiments seem to be clean-cut. *In no case did mosquitoes become infected after plasmochin treatment.* It appears that single doses of as small as 0.2 mgm. per kg. of body weight may affect the viability of crescents, even though they have increased in numbers, and are still capable of living and capable of ex-flagellation."

The number of patients tested was but small; and it must be admitted that the West African negro in the southern United States often carries a surprisingly large number of parasites without showing symptoms. On the other hand, two conclusions stand out pre-eminently from these experiments; first that quinine has no destructive action on the crescentic gametocytes of *P. falciparum*—this observation confirming what has long ago been proved; secondly, that plasmochin in minute and safe doses has a destructive action on these forms of the malaria parasites.

To summarise, the position reached by the authors is that in cases of malaria one should always prescribe a quinine mixture, in order to destroy the schizogony forms of the malaria parasites, but also at the same time doses of from 3 to 5 cgms., or ½ to ¾ grain, of plasmochin in order to destroy the gametocytes. The dual

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

combination may well be ideal; for it destroys not only the asexual schizogony cycle which is causing malarial fever in the human host, but also the gametocytes which will carry on the infection, via. the transmitting anopheles mosquito, to the next human host; and that—be it noted—with a minimal dose of plasmochin which cannot possibly prove toxic on administration, and which is especially suitable for mass administration on a large scale to coolies on tea gardens and mines, troops in cantonments, prisoners in jails, and all mass collections of labour forces.

There appears to be here an approximation to what we may regard as the ideal in the therapy of malaria. Quinine is utilized to destroy the infection in the patient, plus minute and safe doses of plasmochin to destroy the gametocytes and thereby render him non-infective to the transmitting anopheline mosquito. Further, the combined dosage of both drugs is guaranteed to be safe to the patient, and free from all possibilities of toxic symptoms developing. The authors of this most interesting memoir are men who are very well known in the world of tropical medicine, investigators who have made the study of malaria in Central America for several years their special duty, and whose work is entirely reliable. Their conclusions are (wisely) restrained; but the inferences are of immense importance. We are here on the verge of a true *therapia sterilisans magna* with regard to malaria; a therapeutic combination which will not only cure malaria in the human subject, but also prevent its transmission from the human subject to the mosquito, and that without any toxic symptoms in the human patient concerned—a treatment suitable for mass treatment of out-patients of all classes.

The authors are wise to insist that their report is only of a preliminary character; yet its importance in the practice of medicine in the tropics appears to be very great.

REFERENCE.

Barber, M. A., Komp, W. H. W., and Newman, B. M. (1929). Observations on and experiments in the Panama Division of the United Fruit Co., with special reference to certain measures for the control of malaria. *United Fruit Co., Medical Department, Seventeenth Annual Report*, for 1928. Boston, Mass., p. 34.

CORRIGENDA.

IN our November issue on page 603, in the last line of the first column and the first line of the second column the words "microfilaria" and "microfilariæ" should *read* "larva" and "immature filariæ," respectively, as they appeared in the authors' typescript.

The word "microfilaria" is not a generic term, and is frequently used by writers to indicate any microscopic stage of the worm. This careless use of the word is not desirable. Yorke and Maplestone (1926), and Baylis and Daubney (1926) agree that the word should be used more specifically to indicate "immature Filariidæ occurring in the blood stream of vertebrates." The word "agamofilaria" would have covered both terms in the particular context; this, according to the above-quoted authorities, is a collective name applicable to all larval filariæ.

H. A. Baylis, and R. Daubney (1926). *Families and genera of Nematoda.* British Museum, London.
W. Yorke, and P. A. Maplestone (1926). *The Nematode Parasites of Vertebrates.* J. A. Churchill, London.

On page 631, in the 17th line from the bottom of the first column, for the word "sensitive" *read* "positive." Microfilaria were found in the peripheral blood in this case; an editorial correction was made under a misapprehension.

EDITOR, *I. M. G.*

Current Topics.

Barium Chloride in Typhoid Fever.

(Abstracted from *The Prescriber*, June 1929, Vol. XXIII, p. 224.)

K. ROUTKEVITCH, of Krasnodar, U. S. S. R. (*Presse méd.*, 1928. Aug. 18, 1046—1048), states that in 1908 he demonstrated that barium salts produce vasoconstriction, with consequent rise in blood-pressure, and stimulate the vagus and the myocardium. On the basis of these observations he gave barium chloride to thirty-five typhoid patients whose myocardium was in good functional condition. The salt was given by mouth in doses of 0.06 to 0.1 gm. (1 to 1½ grain), increased progressively to 0.5 gm. (7½ grains), three times daily for 6 to 7 days, with intervals of 3 to 5 days. Intravenous medication was not tried, on account of uncertainty regarding the absolute purity of the salt. Results were good, the striking feature being the very satisfactory general condition of the patient: the toxæmic phenomena disappeared, the appetite returned, and it was difficult to believe that the patients had typhoid. Of the thirty-five patients, two died; one from a profuse intestinal hæmorrhage and one after pneumonia. In the other patients the administration of barium chloride was followed after one or two days by a decrease in temperature, then a slight elevation, and a progressive drop by lysis or by crisis. The action of the barium chloride was several times verified by interruption of its administration; this was always followed by a rise in temperature, which fell again when the administration of barium chloride was resumed.

Remarks on the Gall-Bladder in Relation to Focal Infection.

By D. P. D. WILKIE, M.Ch., F.R.C.S.

(Abstracted from *The Brit. Med. Journ.*, July 13th, 1929, No. 3575, p. 37.)

GALL-BLADDER disease commands our attention from three aspects—namely: (1) As a cause of recurrent attacks of acute abdominal pain. (2) As a cause of persistent reflex flatulent dyspepsia. (3) As a focus from which infection spreads to various organs and tissues throughout the body.

With biliary colic and with gall-bladder dyspepsia we are all thoroughly familiar, and I do not propose to touch on these subjects, nor will I refer to complications such as obstructive jaundice and pancreatitis. Our concern to-day will be entirely with the infective aspect of gall-bladder disease and its relation to certain common ailments of obscure ætiology.

The importance of the study of the "pathology of the living," which Moynihan has done so much to emphasize, is seen nowhere to such advantage as in the investigation of biliary disease. Post-mortem pathology taught us practically nothing in regard to the essential features of infection of the biliary passages. The gall-bladder is the organ above all others which suffers from early post-mortem changes which mask all the finer pathological features. Indeed, the frequency with which gall-stones were found at post-mortem examination tended

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to obscure the significance of gall-bladder disease and its relation to other morbid changes.

To surgery belongs the credit of disclosing the frequency of gall-bladder infection and of defining its essential characters. The study of the early stages of cholecystitis in the operating theatre and clinical laboratory has proved a fruitful field of observation during recent years, and the correlation of this study with experimental research has led to results which are fundamental in their bearing on pathology. The practice of extirpating the gall-bladder when it has shown clear evidence of disease has provided an experiment the results of which have been illuminating, and we are now in a position to speak with some assurance regarding the rôle which this organ plays as a seat of focal infection. We now know that gall-bladder infection, far from being merely the result of the straying of bacteria into its lumen by way of the bile, as was so long believed and taught, is a very definite specific blood-borne infection of the wall of the organ by a streptococcus which has a specific affinity for this tissue. This idea, which sprang from the pioneer work of Rosenow, has received ample confirmation in the Surgical Research Laboratory in Edinburgh, from the work of Illingworth, and of A. L. Wilkie. The latter was able to isolate a streptococcus from 84 out of 100 gall-bladders removed at operation for biliary disease. He showed that, whilst the bile was usually sterile, there could be isolated from the wall of the viscus, and still more readily from the cystic lymph gland, a streptococcus which had this peculiarity—that it was killed or its growth inhibited by the presence of bile. The customary method of making cultures from a snipping of the whole thickness of the gall-bladder wall had failed to obtain a growth because the mucous membrane, included in the section, had bile adhering to it.

Wilkie showed that intravenous injections of an emulsion of this streptococcus into rabbits produced with great regularity a chronic cholecystitis with gall-stone formation, in every way similar to that found in the human subject. The *Streptococcus viridans*, which was isolated in these cases, resembled closely that found so frequently in pyorrhœa, in infected dead teeth, in chronic tonsillitis, in chronic gastric ulcer, in chronic appendicitis, and in the nodules in chronic muscular rheumatism. In a few cases, three or four in all, we have isolated *B. welchii* from the wall of the gall-bladder, and, although rare, this form of infection is peculiarly toxic, and in its acute phase may prove fatal. The *B. coli*, although not infrequently found in acute obstructive cholecystitis, has proved in our experience to be a rare type of infection in chronic gall-bladder disease.

The conception of chronic cholecystitis as a blood-borne streptococcal infection situated within the wall of the gall-bladder, indolent, slow, tenacious, causing at first little interference with the bile storage and concentrating functions of the organ, but permitting of streptococcal invasion of the lymph stream, as evidenced by the frequent presence of the organism in the cystic lymph gland and thence possibly infection of the blood stream—this conception, now a proven reality, establishes the important rôle which the gall-bladder may play as a focus of infection. There is now a considerable body of proof that a chronic streptococcal infection may have an intimate ætiological relationship to many of the so-called chronic rheumatic conditions of joints and of fascial planes, to myocardial degeneration, to certain renal conditions, and to some affections of the central nervous system.

Possessed of the knowledge that the gall-bladder is very frequently the seat of a chronic streptococcal infection, it would seem to be only natural that we should search for evidence of gall-bladder disease when casting about for a focus of infection in our investigation of cases of any of the above-mentioned maladies. I propose to refer to some cases in which such an ætiological relationship appeared to be possible, and in which the removal of an infected gall-bladder was followed by a notable amelioration in the secondary lesion.

Chronic Arthritis.

Miss S., aged 32, had suffered for almost two years from a chronic rheumatic affection of both knees which did not yield to local treatment or anti-rheumatic remedies, and which incapacitated her from all forms of active exercise. She also suffered from a mild flatulent dyspepsia, and on two occasions during the past six months had had an attack of severe pain in the upper abdomen, accompanied by vomiting and diarrhœa, and by marked tenderness under the right costal margin.

On examination she looked healthy and was well nourished. Her knees were slightly swollen and were painful on movement. Definite tenderness was elicited over the gall-bladder. A cholecystogram showed a fairly well-defined gall-bladder shadow.

At operation, in January, 1928, the gall-bladder was found to be small, was slightly opaque, but not appreciably thickened. There were no gall-stones; the other abdominal organs showed no abnormality. The gall-bladder was removed and cultures were taken from the bile, from the gall-bladder wall, and from the cystic lymph gland. Those from the bile and gland were negative, that from the wall of the gall-bladder gave a pure growth of a streptococcus which, on injection into rabbits, produced cholecystitis.

Progress.—One year after operation the patient reported that within a few months of the operation the rheumatic condition of the knees had cleared up completely, and that she could skate and play badminton for hours on end without ill effect.

Comment.—The above case is one of a number in which so-called rheumatoid joint conditions have shown lasting improvement following cholecystectomy.

Toxic Myocarditis.

Mrs. A., aged 45, complained that for two and a half years she had suffered from increasing breathlessness and palpitation on slight exertion. She had been subject to persistent flatulence after meals for at least seven years, and on several occasions had been laid up with attacks of severe pain in the epigastric region and the right side of the chest, and had been treated for "congestion of the lungs" in two of these attacks. Owing to her inability to take exercise without distressing breathlessness she had got much stouter during the past year.

On examination the patient was rather stout, pale, and of poor muscular tone. Moderate exercise induced breathlessness and rapid heart action. There were no cardiac murmurs, but the heart sounds were feeble. There was very definite tenderness on pressure below the right costal margin. A cholecystogram showed a definite gall-bladder shadow with a few negative areas indicating calculi.

A diagnosis of cholecystitis with gall-stones and myocarditis was made and operation was recommended.

Operation (June, 1926).—A greatly thickened gall-bladder, containing numerous calculi, was removed. A pure growth of a streptococcus was obtained from the wall of the gall-bladder; the bile was sterile.

Result.—Complete recovery.

Comment.—The "cholecystitic heart," as it has been termed, is, in my experience, a very common condition. It would appear to result from chronic toxæmia, probably first a slight myocardial degeneration, later complicated by fatty infiltration owing to the patient's inability to take exercise without distress, and the consequent obesity so common in these cases. It is the myocardial change which presents the chief risk of operation in old-standing and neglected cases, and which makes acute infective complications, when they supervene, so dangerous.

Facial Neuralgias.

By PHILIP A. HARRY, M.D., D.P.H.

(Abstracted from *The Prescriber*, June, 1929, Vol. XXIII, p. 209.)

A MINOR form of trigeminal neuralgia is frequently complained of and causes a good deal of inconvenience and incapacity. At first the condition may be diagnosed,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

according to the position, as eye strain, sinus disease, or dental infection, until it is discovered that local treatment is insufficient. It is important that a correct diagnosis should be established, as major operations on the Gasserian ganglion are of no value in this type of facial neuralgia. Trigeminal neuralgia is most common after the third decade of life and is associated with arteriosclerosis, general and cerebral, whereas facial neuralgia is found in younger patients, chiefly females, and is associated with foci of infection and a less chronic ætiology than in the other condition. As age advances it is possible for the milder to develop into the more severe type. The pain is less acute in the former, but more constant; in trigeminal neuralgia the pain is described as sudden, severe, sharp, shooting, lancinating, and excruciating, and is usually of short duration. Pain due to sinus infection is more or less constant and may be accompanied by local tenderness, while in dental caries the pain persists after the patient retires.

The type of facial neuralgia under discussion is similar to that described by Sluder as spheno-palatine neuralgia. The pain is constant, dull, and boring in character, and is situated usually in the superior maxilla but may radiate towards the malar bone and temple to the gums and hard palate, and towards the sphenoid and back of the neck. The pain is moderately severe, and in neurotic subjects will be sufficient to incapacitate them from work. Unlike the major neuralgia, the pain is referred more to the periphery than to the course of a particular branch of the nerve. The condition is associated with hysteria and other mental states; in women it occurs more frequently on the right side of the face. It is fairly common during pregnancy and may be secondary to malaria, syphilis, alcohol, lead poisoning, or other toxic states. General states of the body have an important bearing on the condition.

The pain is usually worse during hunger, fatigue, or excitement, and when the patient is debilitated. Vasomotor changes are frequently noticed, the face showing pallor or flushing, together with a certain amount of swelling. Lachrymation, salivation, or sweating may be present. A draught of cold air, a sudden change of temperature, or the act of stooping may be sufficient to accentuate an attack and increase the already distressing symptoms.

Besides the spheno-palatine type of facial neuralgia a similar group of symptoms is produced secondary to zoster. It can be differentiated by the character of the pain, which is persistent and burning; there is no tendency, however, for it to spread into the territory of the other divisions of the trigeminus. The presence of the cutaneous scars will also assist in the diagnosis. Geniculate neuralgia is essentially an otalgia, the pain radiating downwards into the neck and forwards into the face.

Another type of facial neuralgia is that associated with convulsive tic. It is characterized by spasmodic contraction accompanied by severe facial pain. The facial contortions resemble chewing or masticatory movements. Tumours involving the fifth nerve will give rise to facial neuralgia. These may be classified as inflammatory or neoplastic growths compressing the sensory root, and lesions of the brain stem such as cerebello-pontine tumours, syringobulbia, and softening following arterial thrombosis. Neuralgias with no definite organic basis, occurring in patients with unstable mentality, may be diagnosed as hysterical. The pain has a bizarre distribution, is constant and often bursting in type, and is accompanied by no objective signs. The pain of migraine may be felt in a limited area in the region of the fifth nerve, but this is chiefly supra-orbital.

With regard to the ætiology of facial neuralgia, it is important to ascertain if there is a dental cause of the trouble. The examination, which must be thorough, must include an x-ray as well as an individual investigation of each tooth. A case has been reported where a hidden cavity containing a portion of a bristle was the cause of the facial neuralgia. Teeth with large amalgam fillings are especially liable to pulp irritation and other changes.

In a consideration of pain phenomena of the face, the importance of the sympathetic must be remembered. Throughout the region supplied by the fifth nerve there is abundant provision for sympathetic control and association. At one time operations on the cervical ganglia were strongly advocated for neuralgic conditions of the face, chiefly on account of these significant connections, as well as of the fact that electrical stimulation of the cervical sympathetic or the periarterial sympathetic plexus of the common carotid artery will produce pain within the zone of the trigeminal distribution. In these cases the patient, in relating his history, often gives a confused and indefinite picture of the character and location of the pain. Dissociation of sensation is not marked and there is not the clear distinction between the types of pain, or the thermal and pressure sensations giving rise to burning and smarting, boring and grinding, or stabbing and pricking. In some cases facial neuralgia is a symptom of peripheral neuritis due to an inclusion of the terminal filaments of the fifth nerve in an inflammatory process. The pain, originating with the infection, is more or less constant, often throbbing in character and subsiding with the cessation of the inflammation. The pain is not paroxysmal. Many responsible authorities hold that trigeminal neuralgia is secondary to an ascending neuritis, although treatment of oral sepsis and extraction of teeth will not cure this type of neuralgia.

Sinus disease is frequently a cause of facial neuralgia and recurrent headaches. Antral abscess may be secondary to dental caries, but like infection of the other sinuses it is produced more often than not by infection from the nasal passages. There is marked periodicity in the pain from this disease; commencing at 10 or 11 a.m. it may last until 5 p.m. The diagnosis is confirmed by eliciting tenderness on pressure over the affected sinus. Antral pain is at first referred to the upper jaw below the orbit, but it may spread over the whole trigeminal area, extending down the neck and arm. Besides lavage of the antrum and transillumination, an x-ray investigation should be made. In one case pressure on a certain spot below and above the inferior turbinate was sufficient to produce an attack of facial neuralgia; in this case also Dalrymple's sign and Stellwag's symptoms were present on the affected side, and there was a noticeable increase in the dilatation of the right pupil. In this connection reference should be made to the following case; a female patient, suffering from pulmonary abscess, complained of facial neuralgia with severe stabbing pain in the region of the inner canthus, the side of nose and cheek below the eye on the same side as the abscess of the lung. Lachrymation is mentioned, although there is no note with regard to the size of the pupil. The occurrence of the referred facial pain is explained by recounting three possibilities: (1) Impulses might reach the central nervous system by way of the phrenic nerve (a portion of the nerve had been excised to relieve the troublesome cough); (2) there might be an accessory phrenic nerve, joining the phrenic distally to the excised portion, having central connections with the caudal portion of the trigeminal; (3) newly formed fibres might extend from the abscess to the distal end of the phrenic. The pain was always relieved after free expectoration.

In the treatment of facial neuralgia it must be remembered that infection plays a greater part, primarily, than in the cases of true trigeminal neuralgia, and the focus must be sought out and removed if possible. The administration of the constant current of as high an intensity as the patient can tolerate has proved successful in a few cases. No difficulty attends the administration of the treatment, and the improvement is more lasting than with x-ray treatment. The benefit is said to be obtained from the reflex stimulation and its consecutive effects set up by the current. Sluder has reported relief in many of his cases from the administration of alcohol and phenol in the form of injections into the spheno-palatine ganglion, as well as by the application of silver nitrate externally to the mucous membrane of the region.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Modern Surgery in the Treatment of Empyema.

By FRANK J. HATHAWAY, M.D.

(Abstracted from *The Practitioner*, August 1929, Vol. CXXIII, No. 2, p. 103.)

SURGERY has advanced with such tremendous strides, especially as the outcome of our experience during the Great War, that now a surgeon is not satisfied with mere palliative treatment, but aims at a much higher ideal, namely, "restoration of function" of the diseased organ or part of the body.

In every branch of surgery there is, with increased knowledge, this very definite and recognizable aim at a higher ideal, and it is in chest surgery that greater advances have taken place in our time than in any other branch of surgery. Before the war, the surgeon who dealt with major thoracic surgery dared not deal with the lung as is now done. He used some method to maintain the pressure in the lung for fear of its collapse. It is now known that we can open the pleura, produce a pneumothorax, handle and operate on the lung with impunity, and with the certainty that the lung will re-expand and that restoration of function will be re-established.

At one time it was considered sufficient to evacuate the pus with or without rib resection, insert a drainage tube, and leave the question of re-expansion of the lung as a minor point. It is now realized that, given the suitable case, re-expansion of the lung and restoration of its function is much more important than the mere evacuation of pus from the pleural cavity.

This is aiming at the ideal treatment, but before discussing this the surgical treatment of empyema must be considered from all its aspects. First, a distinction must be drawn between the treatment of empyema in infants and older children and adults. Among infants the mortality is so high and the operation of rib resection so dangerous that in them we must be satisfied either with aspiration, repeated frequently, or simple and rapid incision with drainage—or with the excellent closed method of drainage and aspiration advocated and brought forward by Poynton and Reynolds.

Secondly, after the age of infancy more elaborate methods of treatment can and should be considered. But now any method of treatment must depend on the organism which is the cause of the disease—i.e., pneumococcal, streptococcal, staphylococcal, influenzal or other causes, such as tubercle or actinomycosis. It is of great interest to notice how organisms which have their normal habitat in any one part of the human body increase in virulence when they get into any strange part of the body. For instance, the *Bacillus coli* is a normal inhabitant of the intestinal canal and we know that should it invade the peritoneum this membrane can—provided we can deal with the paralytic ileus of general peritonitis—destroy it much more readily than some years ago we believed it possible. In other words, the peritoneum is naturally highly resistant to infection from *Bacillus coli*; on the other hand, *Bacillus coli* infection of the bladder or kidney and the resulting pyelitis and cystitis may be of a very serious character.

Again, the pneumococcus in the lung or pleura sets up pneumonia or empyema, and we get as a result a recognized severe infection with which, given ordinary strength in our patient, the lung or pleura can deal. But when the pneumococcus gets into the peritoneum or into a joint, we know how devastating and malignant the disease and the infection caused by it can be and it can cause far more toxæmia than it would in its normal habitat. A streptococcal or staphylococcal empyema is a much more serious and fatal disease than a pneumococcal empyema.

A pneumococcal empyema can be treated with far more confidence than an infection caused by any other organism. Therefore the treatment of any but a pneumococcal empyema must be free incision and drainage—the object of treatment now being the saving of life rather than restoration of function. But in pneumococcal empyemas, which, after all, are the commonest, the ideal of treatment is higher, the object being early re-expansion of the lung rather than the mere evacuation of pneumococcal pus. When, therefore, the presence of pus in the pleural cavity has been definitely determined by aspiration, the first thing to do is to find out the bacteriological nature of the causal organism. The previous history of the case will of course give much help in the diagnosis.

If it is streptococcal, influenzal, or any infection other than pneumococcal, the treatment is either continued aspiration—which is frequently the best treatment in severe streptococcal cases—or free incision, rib resection and drainage. Should the lung not re-expand, some form of plastic operation, which will be discussed later, must be carried out at a subsequent date.

In a pneumococcal empyema the pleura can deal with this infection much more readily because it is naturally resistant to the pneumococcus.

The object in treatment then is not mere evacuation of pus, but restoration of function and early re-expansion of the lung.

In these cases wonderful results can be obtained by correct technique and immediate closure with healing by first intention.

Naturally the ideal result is not obtained in every case. Cases in which, despite the length of the illness, there are no adhesions between the visceral and parietal pleura do best. But cases with many adhesions are not so favourable.

Long-standing compression of the lung, owing to delay in diagnosis, is not so important, because if there are no adhesions then, given favourable conditions, although the lung has been compressed for many weeks, it will quickly re-expand. What are the favourable conditions for restoration of function of the lung? First and foremost, I put immediate closure of the wound and by this means the abolition of a "sucking wound." Atmospheric pressure plays a large part in the problem because the atmospheric pressure of air with a sucking wound is greater than the pressure of air in the lung, and the frequent dressing of such an open wound, with an open drainage tube, does not give the lung as good a chance to re-expand as a closed method. A closed method of drainage, in those cases in which there is the least doubt of a successful result by first intention, should be carried out, and in any doubtful case I use a glove drain, i.e., a soft colotomy tube turned inside out; this allows pus to escape without allowing the ingress of air.

The technique of the immediate closure of pneumococcal empyemata is as follows:—

(1) Sufficient resection of rib must be made to allow the whole hand to be introduced into the pleural cavity. The object of this is threefold. First, to evacuate all the big fibrinous clots which are present; secondly, to separate as many adhesions as possible; and, thirdly, to decorticate the lung if necessary. These last two objects are attended with much bleeding, and one can only be guided by experience as to how far one should go in this separation of adhesions and decortication. But the free bleeding will soon cease once the chest cavity is closed.

(2) After this treatment, the pleural cavity is washed out freely with a solution of 1-5,000 perchloride of mercury, because the pneumococcus is particularly susceptible to this fluid. I leave a large amount of this fluid in the pleural cavity and have never seen any signs of mercurial poisoning. The chest wall is then sewn up in successive layers, pleura and muscles with catgut with interrupted sutures, and the skin with silkworm gut.

The after-treatment is very important, and is that of continued aspiration of the fluid left in the pleural cavity. This is quite painless; an exploring syringe is inserted daily between the edges of the wound and evacuates the contained fluid. This fluid is sent to the pathological department for bacteriological examination, and in favourable cases it is found that the number of organisms per field steadily diminishes until the fluid is sterile; and very soon, with rapid re-expansion of the lung, no fluid is left in the pleura. On the other hand, should this ideal result not be attained, it is then a simple matter to take out a few stitches and insert a drainage tube

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

No harm is done—the general condition of the patient has not deteriorated and one simply relapses to the old-fashioned treatment of an open drainage tube.

The object of the ideal treatment of immediate closure and the abolition of a sucking wound is twofold. First, quick re-expansion of the lung, and, secondly, to prevent secondary infection. It is obvious that with an open drainage tube, no matter how carefully the sterile dressing is carried out, there must be a secondary infection of the pleural cavity.

The modern surgical treatment of empyema is not easy and has made but little progress. The ideal is very difficult to attain, but I have been distinctly gratified in many cases in which healing by first intention and immediate re-expansion of the lung have occurred. This has markedly shortened convalescence and has also done away with any resulting scoliosis.

It may be said, on the contrary, that these successful cases are those which do so well with rib resection and drainage. I quite agree—but why not aim at an ideal method of treatment? If the perfect result is obtained so much the better. On the other hand, if any case does not do well, it is a simple matter to carry out some form of drainage afterwards and the patient is none the worse. The ideal has then been aimed at and not accomplished, but we can only endeavour. If we do not try to get an ideal result, then we are not progressing on the only lines in which the treatment of empyema can progress.

To recapitulate, the three important points in treatment of pneumococcal empyemas are the following:—

(1) An incision large enough to allow the whole hand to be inserted into the pleural cavity.

(2) Abolition of a sucking wound by immediate closure.

(3) Repeated daily aspiration.

(4) Progress, I consider, can also be made in the treatment of an allied condition of the lung, i.e., bronchiectasis. The present-day treatment is very unsatisfactory, and I believe the right line of treatment is ligation of the pulmonary artery and division of the phrenic nerve. The object of ligation of the pulmonary artery is to produce a venous congestion of the lung with its resultant fibrosis, and division of the phrenic nerve to stop the irritating cough. I have not myself had a case on which to carry out this operation, but I shall certainly do so when the opportunity arises. It has been successfully carried out by Professor Wilms.

As regards the treatment of those cases—no matter what may be the causal organism—where the lung has no possible chance of re-expanding and again filling the rigid chest cavity, what should be done? Fortunately, these cases are exceptional and are due to neglect and want of early treatment. First, the wound should thoroughly be opened up and proper drainage established. If this is found to be faulty it should be placed at the lowest level of the old lung cavity and Carrel-Dakin treatment carried out. If, in spite of this treatment, the sinus does not close, it is obvious that, as the lung will not fill the thoracic cavity, the only logical course is to operate and make the rigid thorax come down to the collapsed lung. The extent of the cavity should be determined by injection of lipiodol and an *x*-ray photograph.

Then following the teaching of Basil G. Beck, of Chicago, the open method of interthoracic surgery should be carried out. By this is meant a modified thoracoplasty dependent on the size of the resultant cavity and filling up this cavity by skin grafts or sliding skin-flaps. I have had several such difficult cases to deal with, and have had in every case an excellent result.

In conclusion, empyema presents great difficulty in treatment. The recognized and well-established treatment of this disease is given in any textbook on surgery, but until the last few years no progress has been made, and it is obvious that no progress can be made except on the lines of aiming at early restoration of function of the lung. This can only be attained by immediate closure, with its four main objects:—(1) Healing by first intention; (2) early convalescence; (3) abolition of a sucking wound and secondary infection; (4) early restoration of lung function.

Investigation of Pulmonary Conditions With Lipiodol.

By MAJOR A. G. BIGGAM, O.B.E.

(*Journ. Royal Army Med. Corps*, Vol. LIII, No. 1, July, 1929, p. 1.)

THE technique of administration of lipiodol is simple, and the information obtained from its use has proved of the very greatest value in certain pulmonary conditions where the diagnosis has been in doubt.

Composition and Local Effects on the Tissues.

Lipiodol is a compound of iodine in poppy-seed oil and contains 40 per cent. iodine. It is a clear amber-coloured fluid when fresh, but tends to darken after being exposed to light for a long time and should then not be used.

The iodine contained in it renders the oil opaque to *x*-rays, and so after injection its position in the tissues can be demonstrated by the radiologist.

The iodine is actually in combination with the unsaturated oil, and so has none of the irritating action on the tissues that one associates with the presence of free iodine. It does not stain the skin, and can be injected anywhere in the body without producing local irritating effects. It has been used intramuscularly and intrathecally and, even in the latter situation, the oily compound is usually found to produce no local irritative symptoms. I have, however, observed on two separate occasions some pain complained of in the lumbo-sacral region, due to the collection of the lipiodol there in patients when the injection was made by cisternal puncture for the elucidation of obscure spinal conditions. The pain, however, was of short duration and after a couple of days or so entirely disappeared. In pulmonary cases after injection into the trachea this heavy oily compound spreads down and lines the trachea, bronchi, bronchioles, and eventually the alveoli. An *x*-ray will then be able to demonstrate the size and condition of the various parts of the air passages outlined by this radio-opaque substance.

The oil is removed from these situations chiefly by expectoration, but a little of it remains in the lung and is dissociated by the pulmonary tissue, the iodine then being got rid of chiefly by the kidneys. The rate at which the lung is rendered free from the lipiodol varies; in some cases very little opacity remains after a few hours, but one has occasionally observed its presence in considerable quantities even as long afterwards as a fortnight.

There is practically no danger attached to the injection, even when the operation is carried on very carelessly and the oil allowed to flow into the peritracheal tissues. I have observed a case where practically the whole of the injection had been made into these tissues and was demonstrated there by *x*-rays. The patient, however, complained of no discomfort, the oil gradually extending down the tissues into the mediastinum and eventually becoming absorbed with no ill-effects to the patient.

It has been stated that ill-effects may result from the administration in cases of pulmonary tuberculosis, but I have not observed any injurious results after its use in such cases. It appears to me, however, inadvisable to employ it in cases with a history of recent hæmoptysis, for in these cases the residual oil, after dissociation, may possibly cause sufficient disturbance to lead to a recurrence of the hæmorrhage. Such occurrences have been noted by me, but in cases like this it is always difficult to decide whether the hæmorrhage has recurred as a result of the injection, or merely in the ordinary course of events.

In cases of bronchiectasis the patient states, not infrequently, that he is much relieved by the injection, and I have had patients make repeated requests for further injections owing to their having experienced relief from the previous administration.

The sputum in many cases is definitely diminished for some days following, but I have occasionally observed

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the quantity to increase, even up to as much as double the amount, for a few days after the injection.

It is well to warn the patient that after the injection the sputum coughed up should be spat out and not swallowed, so as to get rid of the iodine from the system. I have, however, not infrequently observed opacity caused by the oil lying in the stomach, this having been swallowed after being coughed up, but apart from an occasional slight iodine coryza no ill-effects have ever resulted from this in my series of cases.

Information obtained by Lipiodol Injection.

Very valuable information is obtained by *x*-ray examination after the injection. It will show the outlines of the trachea and bronchi, and any compression or obstruction there will be visualized, likewise any dilatation of the bronchi or cavity formation in the lung parenchyma communicating with the bronchi will be demonstrated.

Indications for its Use.

The common lung conditions in which most assistance may be expected are those associated with chronic cough and expectoration. The clinical signs in this type of case are often very indefinite, and ordinary *x*-ray examination may not help very much in elucidating the underlying condition, which may vary from an ordinary chronic bronchitis to pressure causing obstruction to the air-passages due to masses of glands or a tumour. In such cases lipiodol followed by *x*-ray examination will often clear up the problem at once.

The differentiation between chronic bronchitis and bronchiectasis is often impossible without lipiodol injection, for the latter condition may exist without any of the typical symptoms, such as paroxysmal cough and profuse expectoration.

There may be only a history of cough with slight expectoration, and physical examination may not reveal any signs of dilatation of the bronchi, which may be too far from the surface to produce recognizable physical signs. In such a case lipiodol may demonstrate even quite large cavities which had escaped detection even after repeated clinical examination.

Where the diagnosis of bronchiectasis is in no doubt whatever, and the question of operation is being considered, the injection is also essential to confirm one's findings that the condition is unilateral and the case therefore suitable for operative treatment by phrenic avulsion, thoracoplasty, lobectomy, etc.

In bronchiectasis it is essential that the patient should carry out postural coughing prior to the injection so as to empty the dilated bronchi of secretion. Obviously, if they are already full of thick contents, the lipiodol will float on top of this viscid substance and not enter the cavities in the same way as if care had been taken to have them emptied prior to the injection. The emptying is also important from the point of view of diminishing the tendency to cough after the injection has been made until the radiologist has had an opportunity of obtaining the necessary pictures of the lung with the oil *in situ*.

Methods of Carrying out the Injection.

No special skill is required to enable one to carry out the injection, and the assistance of the surgeon should not be necessary, the operation being carried out by the physician, either in the ward, or, if this is not conveniently situated to the *x*-ray room, it can be done actually in the *x*-ray department.

There are various methods of getting the oil into the air passages, but the one I have used most extensively has been injection by the crico-thyroid route. The patient, if nervous, should have a preliminary injection of morphia one-sixth grain half an hour beforehand. He should be propped up by pillows in the semi-sitting position with the head supported in the extended position by pillows and kept in the middle line. This ensures that the structures on the anterior aspect of the neck will be kept on the stretch and less liable to slip about during subsequent manipulation.

The surface having been prepared, the skin and subcutaneous tissues down to the cricothyroid membrane are anæsthetized by half per cent. novocain, using only a very little anæsthetic so as not to obliterate the landmarks.

The next step is to inject some cocaine inside the larynx so as to anæsthetize the structures inside and thus render them less sensitive. This is done by using a two-cubic-centimetre syringe with a stoutish needle, containing 10 minims of a five per cent. solution of cocaine.

The cricoid cartilage is fixed between the thumb and index finger of the left hand, and the needle inserted above the cricoid cartilage at right angles to the surface and pushed through the tissues till it is felt to slip through the membrane into the underlying air passage. It is always easy to recognize when this has happened.

The piston of the syringe having been withdrawn to suck in some air and so ensure that the point is free in the air passage, the cocaine is quickly injected and the needle withdrawn at once. Coughing will be induced by the contact of the cocaine with the sensitive mucous membranes and this will assist in spreading the local anæsthetic over the required area. The next step is the actual injection of the lipiodol, and here there is one most important point to be considered, that is the consistency of the oil. It is a thick viscid substance and consequently difficult to get to run through an ordinary fine-bore needle.

The only difficulty I ever experienced in my early cases was that of forcing the oil through the available needle. This was a very real difficulty until we procured a suitable needle.

The needle must be one with a wide bore, and there is now available a suitable one devised by Chandler (a trocar and cannula), the cannula fitting an ordinary ten-cubic-centimetre Record syringe.

We actually used, and still use one devised by my Registrar, Dr. Mohamed Ibrahim, consisting of a lumbar puncture needle cut down to about two centimetres long so as to be more easily controlled and not so liable to scratch the posterior wall of the air passage after having penetrated the anterior wall. This needle fits a ten-cubic-centimetre Record syringe and has a good wide bore which allows the oil to flow readily.

The oil will flow much more easily if it is kept warm by immersing the vessel in which it is contained in very hot water, and if the syringe used for the injection is also warmed immediately before sucking up the oil.

The needle is inserted through the cricothyroid membrane in the same way as for the injection of the cocaine, and here there may be slight difficulty in getting it to penetrate the skin. It has been recommended that a small incision be made in the skin to facilitate the passage of the needle, but this seems to me unnecessary and undesirable.

The needle having penetrated the cricothyroid membrane, the syringe containing the oil is attached and the piston withdrawn a little to allow bubbles of air to enter and so demonstrate that the point is in the correct position, free in the air passage. The piston is then pressed slowly home and the oil gradually injected: the syringe will have to be detached for refilling until the required amount (twenty to thirty cubic centimetres) has been injected. It is advisable to verify the position of the point of the needle occasionally during the injection by sucking up a few bubbles of air.

The patient should be asked to refrain from coughing or swallowing during the injection, and to breathe quietly through the nose.

Usually no interference with respiration is experienced, even when as much as thirty cubic centimetres of oil are used.

The position of the patient after the injection will vary according to the area of the lung requiring investigation. The position and size of the right bronchus is such that, if the position of the patient be not changed after the injection, most of the oil will find its way into the right base.

Where the left lung is to be filled, the patient should be tilted towards that side after the needle has been inserted and before the injection has been commenced.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

If the apex is the suspicious area, about two minutes after the completion of the injection the patient should have his head and shoulders lowered so as to allow the oil, having passed the bifurcation of the trachea, to gravitate to the apex which has now become the most dependent part of the lung.

The patient should be kept in the required position for about ten minutes and then photographed in the supine and the erect position. He should, as already stated, be asked to refrain from coughing till the examination has been completed, and also when he does cough to spit out the material brought up and so avoid swallowing the iodine compound.

Valuable information is occasionally obtained by getting the patient to cough after the photographs have been taken and then taking another picture. By this means lipiodol may be forced into areas of the lung that previously had not been filled.

Close on 100 cases under my care have been investigated by the aid of lipiodol, and no difficulty has been experienced in carrying out the above technique, and in many of these cases very great assistance has been obtained in arriving at a correct diagnosis.

Other routes for the injection have occasionally been tried. At first I made the injections into the trachea below the cricoid cartilage instead of through the crico-thyroid membrane, but this position did not seem to have any advantages over the higher situation, and the trachea was found to be less easily fixed and controlled than the structures above the cricoid.

I have also administered it by the mouth in quite a number of cases, and this route has the advantage, from the physician's point of view, of greater simplicity, and from the patient's point of view entire absence of all idea of anything in the way of a surgical operation.

In carrying out this method I have used an ordinary glass urethral syringe with about three inches of rubber tubing attached to the nozzle. The patient sits in a chair with the head forward and the tongue protruded and held out by hand. The warmed oil is slowly injected, the end of the tubing being kept near the base of the tongue, between that and the uvula, and not touching either so as to avoid inducing retching. The patient should breathe deeply during the time the oil is being injected, and must refrain from swallowing. The tongue should be kept protruded during the whole period the oil is flowing. If the co-operation of the patient is obtained during this simple injection, all the oil will run into the larynx, and any part of the bronchial tree can thus be visualized quite as well as by any of the previous mentioned methods in which needles have to be used. This method has proved highly satisfactory in quite a number of cases investigated by us.

Lipiodol can be obtained in two-cubic-centimetre ampoules or in bulk, the latter form being less expensive and quite satisfactory for carrying out long examinations.

A satisfactory English preparation is now on the market.

Commentary.

(1) Lipiodol injections have been found to be of the greatest value in the elucidation of many obscure lung conditions.

(2) Its use is essential in cases of bronchiectasis, where, from clinical examination, the condition is considered to be unilateral and operative procedure is being contemplated for collapse or for other surgical methods of treatment of the diseased lung.

These clinical findings should always be confirmed by lipiodol injection, followed by an *x*-ray examination to see the exact extent of the disease in the affected lung and to exclude the presence of any commencing trouble on the other side.

(3) There is practically no danger attached to the procedure even when it is carried out carelessly, and some of the oil is injected into the peritracheal tissues.

(4) No ill-effects have been observed by us after administration in cases of sub-acute and chronic pulmonary tuberculosis.

(5) The only type of case in which we still use lipiodol with caution is one with a history of recent hæmoptysis, since the dissociation of the compound in the lung may possibly tend to produce local irritation and a recurrence of the hæmorrhage.

(6) The cricothyroid route has been found by us to be the most generally satisfactory, the procedure being very simple and easily carried out if the difficulty of the thick consistency of the oil is overcome by previous warming and using a large-bore needle.

The oral method has also proved satisfactory, and has the advantage of extreme simplicity.

Reviews.

LEPROSY IN EUROPE, THE MIDDLE AND NEAR EAST AFRICA.—By Robert G. Cochrane, M.D., M.R.C.P., D.T.M. & H. 1928. London: World Dominion Press. Pp. 76. Price 2s. net.

IN order to arrive at an approximation of the incidence of leprosy, Dr. Cochrane, late medical adviser to the Mission to Lepers has been engaged for the past few years in a world survey of this disease, and the volume before us is his second contribution to the subject.

It is not claimed that the figures quoted for many of the areas are even approximately accurate; this is particularly true of Africa as a whole. Perusal of Dr. Cochrane's report, however, discloses two points of considerable interest and undoubted importance—firstly that something (however little) is being done for sufferers from leprosy in even the most inaccessible corners of the earth, and secondly that forcible segregation as a method of dealing adequately with the leprosy problem in any particular area is fast losing ground.

J. M. H.

THE SCIENCE OF NUTRITION SIMPLIFIED: A POPULAR INTRODUCTION TO DIETETICS.—By D. D. Rosewarne, M.R.C.S. (Eng.), L.R.C.P. (Lond.). London: Henry Kimpton, 1929. Pp. VIII plus 314. Illustrated. Price 6s. 6d. net.

THE object of the author is to explain to the lay reader the fundamental principles of nutrition in simple and suitable language. The author's object in this direction seems to have been well fulfilled, as the essential facts of nutrition as described in the book will be easily understood even by those who have had no scientific training at all.

The preliminary considerations of the science of nutrition, such as, the object of dietetics, the functions of food, the chemical processes of nutrition and the methods of dietetics have all been dealt with in Part I of the book as lucidly and completely as possible.

In Part II of the book, the author deals with the special questions with which the subject of dietetics is immediately concerned; viz., (1) the protein, the fuel, and the mineral requirements of the organism; (2) the vitamin requirements of the body, and (3) the physiological functions of oxygen. Part III deals with general considerations of food substances, animal and vegetable, and in Part IV the author deals with the very important subject of dieting. The arrangement and calculation of dietaries, special dietaries of childhood, middle life and old age, etc., have been dealt with in a clear and lucid manner. The chapter on preparation of food is well-written and will repay perusal.

There is a bibliography in the final chapter of the book and this is meant for the guidance of those who wish to amplify their knowledge of the subject.

A useful table is given at the end of the book showing the percentage composition of the main food-stuffs.

We have no hesitation in recommending this book to both medical and lay readers.

J. P. B.

THE ELEMENTS OF THE SCIENCE OF NUTRITION. —By Graham Lusk, Ph.D., Sc.D., LL.D., F.R.S. (Edin.), 4th Edition, re-set. Philadelphia and London: W. B. Saunders Company Ltd. Pp. 844. Illustrated. Price. 32s. 6d. net.

THIS book has undergone four new editions and was also reprinted another three times within four years.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

This fact alone proves the great merit of the book, and it needs no further testimony as a standard book on the subject. Professor Graham Lusk belongs to the Voit School (Munich), being an illustrious pupil of the well-known late Carl Von Voit (1831—1908), who was the leader of a large circle of investigators including the author, Rubner, Atwater, and many others "through whose activity his spirit still lives." We all know what Voit has done to help the advancement of the science of nutrition.

The book gives an *exhaustive* review of the scientific foundations on which our present knowledge of nutrition in health and disease has been built up. The author has taken great care and pains to explain his deductions and conclusions by fully discussing all the evidence on which they are based. The book is a rich store house of useful information, and contains a full account of carefully conducted experiments by experts all over the world.

The extensive and detailed index which the author has appended should prove very useful to those who want to make an intensive study of the subject. The author's index alone covers 32 pages printed in small type (in double lines), and that of the subject-index covers 45 similar pages.

The book consists of 31 chapters and an appendix.

We have no hesitation in saying that this book should form a *vade-mecum* to all who want to make a special study of the science of nutrition.

J. P. B.

PRINCIPLES AND PRACTICE OF MINOR SURGERY.—By E. M. Foote, A.M., M.D., and E. M. Livingston, B.Sc., M.D. 1929. Sixth Edition. New York and London: D. Appleton and Co. Pp. XL plus 787 with 420 figures. Price 35s. net.

THE first edition of this book, the work of the senior author alone, appeared in 1907; since that date five other editions have been called for and in the latest the task of revision has been shared by Dr. Livingston. The result is eminently satisfactory and there is an almost complete absence of that dissimilarity in style which so frequently mars the book written by more than one hand.

The volume is divided into three main parts devoted respectively to minor surgical technique, principles of diagnosis and treatment, and localized surgical treatment The inclusion of such widely different conditions as "black eye" and cancer of the rectum in a volume devoted to minor surgery suggests perhaps that the author's conception of the term is fairly elastic. This tendency to stray into fields which do not strictly belong to the realm of minor surgery adds slightly to the bulk of the book, but its essential merit is not appreciably impaired thereby.

Little more than a rapid general survey could be accomplished in the time at the reviewer's disposal. Chapter V entitled "Anæsthesia in minor surgery" is especially interesting; in the development of local anæsthesia in general and of regional and nerve block anæsthesia in particular American surgeons appear to be advancing more rapidly than their British colleagues. Errors are few and unimportant; at p. 208 "blush" should be "bluish" and at p. 225 "struma" ought to read "stroma"—and "*Lochardt* Mummery" has a distinctly unfamiliar look.

"Principles and Practice of Minor Surgery" is a handsome volume; it is clearly printed on excellent paper and the illustrations, chiefly from original drawings and photographs, are beautifully reproduced; it can be unreservedly recommended.

J. M. H.

A TEXT BOOK OF FRACTURES AND DISLOCATIONS.—By Kellogg Speed, S.B., M.D., F.A.C.S. 2nd Edition. London: Henry Kimpton. Pp. 952. Illustrated with 987 engravings. Price 50s. net.

THERE are many good things in this volume, but there is one maxim which we wish could be posted up in every hospital and dispensary. It is "Treat fractures at once with as much respect and rapidity as the acutely inflamed appendix." It would save much suffering and the not uncommon reproach of a malunited fracture.

The opening chapter deals with general principles in the treatment of fractures, and includes a very excellent description of dressings and splints. The following chapter deals with the operative treatment of fractures The views expressed on this last subject will commend themselves to all surgeons who have had much experience of fracture treatment. They probably will not commend themselves to the strong opponents of operative treatment, nor to the equally extreme enthusiasts for it.

In describing operative technique, perhaps insufficient attention has been drawn to the necessity of using the correct drill for the machine screw used. Neglect of this is the common cause of loose plates.

Chapter III is devoted in the same way to general considerations relating to dislocations.

Having thus disposed of general principles, the remainder of the volume is divided into chapters on a regional basis. These chapters are profusely illustrated, many of the illustrations being outline tracings of *x*-ray plates. A number of other plates are photographs of actual cases as splinted and suspended in the author's practice. These are valuable features, particularly for surgeons who have only occasionally to treat fractures.

Recurrent dislocation of the shoulder is very fully dealt with and the numerous operations for this trying disability are described. The author has his own bone transplantation operation, and naturally prefers it. Clairmont's operation is, we think, condemned unjustly. It is certainly more successful than the author suggests.

Very complete descriptions are given of fractures and dislocations of the carpal bones. These are fractures frequently overlooked and certainly among the most difficult to treat satisfactorily.

The book is up to date and includes all tried and approved methods of treatment. It can be relied upon as a safe guide and as a book of reference.

The printing, illustrating and binding are all that can be desired, and a credit to the publishers.

A. H. P.

THE TREATMENT OF RHEUMATOID ARTHRITIS.—By A. H. Douthwaite, M.D., F.R.C.P. (Lond.), 1929. London: H. K. Lewis and Co., Ltd. Pp. X plus 80 with two illustrations. Price 6s. net.

ALTHOUGH rheumatoid arthritis has been the theme of innumerable discussions in medical and scientific circles, it is a disease about which remarkably little is known. In this small book of eighty pages Dr. Douthwaite reviews succinctly and critically the different ætiological factors and outlines rational methods of treatment.

While not denying the part played by focal sepsis in the causation of the disease in certain cases, the author is at one with Pemberton, Llewellyn and not a few other equally rational although less well-known investigators in condemning the wholesale dental extractions, tonsillectomies and colon excisions that have frequently been performed in the belief that sepsis in one or other of these situations *must* be at the root of all cases of rheumatoid arthritis. A review is given of the respective parts played by endocrine disturbances, vitamin deficiency and diminished oxygen consumption; the author himself suggests that parathyroid dysfunction plus diminished oxygen consumption by the tissues play an important part.

Dr. Douthwaite is an enthusiastic advocate of balneotherapy in early cases and of manipulative treatment in the stage of chronic deformity, but he rightly emphasises the importance of treating each case on its merits and of securing the complete co-operation of the patient.

This valuable little book will do much to clear up the obscurity which at present surrounds the subject. On p. 29 "chrondroitin sulphuric acid" should be "chondroitin sulphuric acid"; our Oxford Dictionary does not give the word "seanance" and we doubt whether even the most scientific agriculturist is capable of unmasking a soil.

J. M. H.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MOVABLE KIDNEY: ITS ETIOLOGY, PATHOLOGY DIAGNOSIS, SYMPTOMS AND TREATMENT.—By William Billington, M.S. (Lond.), Ch.M. (Birm.), F.R.C.S. (Eng.). 2nd Edition. London: Cassell and Company Ltd. 1929. Pp. IX plus 177 with 14 full-page plates and illustrations in the text. Price 12s. 6d. net.

THE first edition of this fascinating work on movable kidney was published in 1910 and now, after nineteen years, a second edition has been prepared by the author. We are told that close attention has been devoted to the subject for twenty-five years, and during that period over 1,500 cases have been operated on. There are few surgical conditions which may produce more varied and more distressing symptoms than movable kidney, and in the words of the author, it "does almost always diminish working efficiency. It interferes with the physical or mental powers, or with both, in greater or less degree."

The subject is discussed in 14 chapters, as follows: anatomical considerations; visceroptosis and nephroptosis; frequency and ætiology; pathology (3 chapters); diagnosis; symptoms (4 chapters); treatment; nephropexy; results. Two pages of references are given at the end of the book.

In Chapter I important details of the surface and internal anatomy of the kidneys are discussed, together with the relations of the kidneys to other organs, indicating how excessive mobility may affect them. The very important attachments of the perirenal fascia are outlined—this fascia does not in the first instance arrest a movable kidney, but in the later stages of prolapse is itself pulled upon and stretched. The real supports which keep the kidney in position are:—(*i*) intra-abdominal pressure; (*ii*) the vessels of the renal pedicle, and (*iii*) the fatty capsule; by far the most important is the first.

Chapter II deals with visceroptosis and nephroptosis. Prolapse of the kidney may be part of the general process of ptosis of the abdominal viscera, known as visceroptosis or Glenard's disease, or this event may occur alone or in excess of the general prolapse, when it is called nephroptosis. The normal movements of the kidneys, tests for abnormal movement, and the not sufficiently recognized form of prolapse termed "rotation of the kidney" are gone into. The author prefers the term "dislocated" to those of "movable," or "dropped," or "prolapsed," for pathologically displaced kidneys. The mechanism of displacement is fully described. As a result of the various movements the hilum comes to look upwards, inwards and forwards, and there is practically no limit to the descent, an iliac or pelvic position even being reached. The congenital type of "floating kidney" is a rare phenomenon. During the descent of the kidney the ascending colon and hepatic flexure are loosened and pushed downwards, and the adjacent peritoneum is also loosened.

The classification adopted for dislocated kidney is that suggested by Wilson and Howell—viz., (*i*) simple prolapse; (*ii*) prolapse with internal rotation of the lower pole; (*iii*) prolapse with rotation inwards and forwards of the lower pole, with lateral mobility and absence of any movement communicated by the diaphragm; (*iv*) rotation with little or no prolapse—the kidney may not even be palpable.

Chapter III discusses the frequency and ætiology of movable kidney. The figures given by various authorities as regards frequency are very dissimilar. This is said to be due to the particular class of patients considered. In neurasthenic women it is probably as high as 30 to 40 per cent., but in healthy women not much higher than 5 per cent. In men the incidence works out at ½ to 1 per cent., and the proportion between the two sexes is given as about 1 to 8½. When examined in an erect position, the author states that of 594 cases of movable kidney investigated the right kidney alone was movable in 186, the left kidney alone in 30, and both kidneys in 368.

Ætiology is discussed under the headings of predisposing and exciting causes. Among the predisposing causes taken into consideration are heredity, debility and spinal curvature; among the exciting causes trauma, errors of dress, carelessness after confinement, constipation, and pathological changes in and around the kidney. Loss of muscular tone from any cause is of great importance; sudden strain may dislocate a kidney for the first time; pregnancy in itself is a negligible cause.

Pathological changes in the surrounding structures and in the kidney itself are discussed in Chapters IV and V. The former are grouped under the effects produced on the perinephric fascia, capsula adiposa, peritoneum, colon, suprarenal capsules, and other organs—including the spleen, and pelvic organs. The widespread, and sometime serious, effects are clearly indicated. In the kidney itself, the effects of undue mobility produce changes in the capsule, ureter and pelvis, the renal vessels, renal parenchyma and nerves, and the urine. The value of taking pyelograms in the erect position is laid stress on. Mobility itself does not produce hydronephrosis as a rule, but this may result from the pressure of an aberrant renal artery. Dietl's crises are evidence of threatened renal strangulation.

General pathology is dealt with in Chapter VI. It is claimed that the very varied symptomatology of movable kidney is explained by the effects of traction and pressure on the sympathetic nervous system, by a disturbance of the normal balance which exists between the two sides of the autonomic nervous system. Further, the author definitely ascribes some of the effects to toxæmia, though this is denied by some authorities. The mechanical and toxic theories are described as complementary, both factors playing a part in the chronic ill-health and lowered efficiency associated with nephroptosis.

Chapter VII deals with diagnosis. Examination is advised with the patient supine, then lateral, and finally erect. Differential diagnosis is discussed between movable kidney and each of the following conditions: Riedel's lobe of the liver, an enlarged gall-bladder, a mass in the colon, pyloric tumour, and an enlarged ovary. Acute attacks of kidney pain have also to be distinguished from renal calculus, gall-stone colic, and appendicitis.

The next four chapters deal with symptoms. It is asserted that a movable kidney always diminishes working efficiency. Local symptoms are discussed under: pain, sudden displacement, obstruction of ureters by an aberrant artery, rotated kidneys, lumbar ache, vesicle irritability, and condition of the urine. The general symptoms are described as a form of neurasthenia—there is fatigue, loss of weight, and depression. Disturbances of digestion and sexual function may occur; the former may be caused by duodenal stasis, chronic appendicitis, or colitis; the latter is due to pressure effects, chiefly on the female pelvic organs. Disorders of the nervous system are among the most important and are of widely differing types, such as—neurasthenia, headache, tachycardia, Raynaud's disease, and disorders of the mind.

Chapter XII deals with the indications for treatment and the methods of treatment and the following chapter with nephropexy. The author is not in favour of support by special belts and trusses, but this method of treatment may help diagnosis. The only effectual method of radically remedying the displacement is by open operation. The essential steps to ensure a successful nephropexy are given, and the author's technique is fully described: Edebohl's incision is used, the kidney exposed and freed, the peritoneum is opened in order to explore other abdominal viscera, the kidney is suspended to the last rib by means of a triangular flap of capsule and also by Brodel's suspensory sutures.

Finally, in Chapter XIV, the results of nephropexy are discussed under the headings of (1) surgical results, and (2) therapeutic results. The results of the author's own series of cases are also given.

Movable kidney is a subject which, in the opinion of the reviewer, is a good deal neglected in India. Appendicitis, and gastric and duodenal ulcer were in the same way neglected for many years, and are only now beginning to be recognized as common and important. As a possible cause of neurasthenia, it must always be borne in mind. The case of an Indian, a bank clerk, is recalled, who was neurasthenic to the extent of threatening suicide, because of the constant lumbar pain and dragging sensation. A very movable right kidney was fixed with complete success, and this created such an impression on the patient's mind that he writes yearly to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"TRADE MARK NORMACOL" BRAND.

Intestinal Evacuant.

"Sweeps the bowel clean"

PAINLESS. HARMLESS.

MECHANICAL IN ACTION.

NOT HABIT FORMING.

For all conditions of Intestinal Stasis.

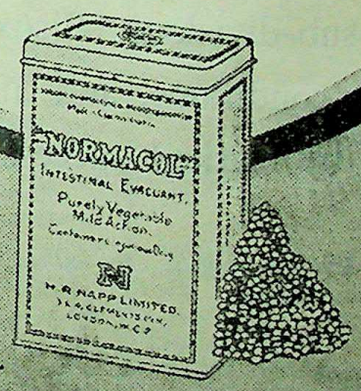
A PURE VEGETABLE PRODUCT.

Containing NO Agar-Agar,

Mineral Oil, Fibrous Roughage or Harmful Drugs.

Full literature on application.

Distributors in India: Smith, Stanistreet & Co., Ltd., Post Box 172, Stanistreet House, 18, Convent Road, Entally, Calcutta.



H. R. NAPP LIMITED.

3 & 4, Clements Inn, London, W.C.2.

Telegrams: "NAPPCHEM LONDON." Telephone: HOLBORN 1444 (Two lines)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In the treatment of

Syphilis

BISOXYL

The ready absorption of Bisoxyl causes the rapid destruction of spirochætes; moreover, the injection is painless and gives rise to no complications.

Bisoxyl may be used alone or in conjunction with arsenobenzene preparations.

Experience has shown that the type of lesions characteristic of syphilis will respond to bismuth treatment even when other drugs have failed. It is of the utmost importance, however, that the bismuth suspension be properly prepared and be in an extremely fine state of sub-division. Bisoxyl fulfils completely these essential conditions, and its administration has been followed by marked success.

Descriptive literature will be sent on request to either of the B.D.H. resident representatives:

HENRY S. CLARK
8/10 Waterloo Street
CALCUTTA

BYRAM MISTRY
Graham's Buildings
Parsee Bazar Street
FORT BOMBAY

THE BRITISH DRUG HOUSES LIMITED
LONDON

Bis/In/2912

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

express his thanks on the anniversary of his operation—a very unusual exhibition of post-operative gratitude!

This book on "movable kidney" should be read by every practitioner. It is a very thorough exposition of the whole subject; the various important aspects are freely illustrated by cases; and, the photographs and drawings are quite clear and sufficiently numerous.

F. P. C.

AN INTRODUCTION TO THE STUDY OF THE NERVOUS SYSTEM.—By E. E. Hewer, D.Sc. (Lond.), and G. M. Sandes, M.B., B. S. (Lond.), M.R.C.S., L.R.C.P. 1929. London: William Heinemann (Medical Books), Ltd. Pp. XII plus 104, with 55 diagrams. Price, 21s. net.

THIS small book, written by two members of the staff at the Royal Free Hospital, London, gives the reader an excellent grasp of the essentials of the anatomy and physiology of the nervous system; the use of numerous well-executed diagrams (many of them in colour) still further enhances the prevailing clarity of the text. There is only one feature of the book at which we cavil and that is the price. Excluding the index (five pages), there are altogether ninety-eight pages of reading matter: to these should be added the majority of the diagrams, which are executed on separate sheets interleaved with the text. The price of the whole is twenty-one shillings—say rupees fourteen. We doubt whether the average medical man in India can afford the luxury of medical textbooks at rather more than two annas per page.

J. M. H.

PHYSICAL DIAGNOSIS.—By C. P. Emerson, A.B., M.D. Second Edition. Revised. 1929. London: J. B. Lippincott Company. Pp. 553 plus XV, with 324 illustrations. Price, 35s. net. Obtainable from Butterworth and Co. (India), Ltd., Calcutta. Price, Rs. 26-4 net.

THERE appears to have been in recent years a marked increase in the number of books devoted to the science of physical diagnosis. Dr. Emerson entered this field in 1928 and already a second edition of his book has been called for. The present reviewer did not have the pleasure of perusing the first edition and he cannot therefore state from personal experience to what extent the volume before him differs from its predecessor. We learn from the preface, however, that "material which recent research has shown to be important enough to deserve mention" has been added. The author deals most exhaustively with the whole range of kindred sciences comprised under the heading of physical diagnosis, and on closing his book one feels that there is little more to be said on the subject. In a field so large divergence of views is, on occasion, inevitable and there are one or two points—minor ones it is true—to which criticism may be directed.

Dr. Emerson does not mention malarial cachexia and severe hookworm infestation (both relatively common conditions in the subtropical regions of America) as possible causes of infantilism. On p. 48 reference is made to the anthrax bacillus as a gas-producing bacterium. It is probable that confusion has arisen between *malignant pustule* (a form of anthrax) and *malignant œdema* a condition with which a gas-forming anærobe is intimately associated. Diabetes and jaundice might have been mentioned (at p. 72) as possible causes of pruritus. The idea that the earliest lesions of leprosy manifest themselves on the nasal or phalangeal (*sic.*) mucous membranes rather than on the skin is now abandoned by competent leprologists. This particular section needs revision, including the removal from its midst of fig. 21—blastomycosis of the hand. The author's hypothesis regarding the mode of production of functional heart murmurs (p. 362) might, we think, have been a little more clearly expressed; and is not talipes equino-varus as common a variety of club-foot deformity as true talipes varus?

These are small points which should not detract from the essential merit of the book as a whole. Our most serious criticism, however, concerns the number of printing errors that have been allowed to creep in. A hasty survey of the work revealed no fewer than thirty-seven of these; in the majority the context makes the meaning clear, but in some the situation is frankly confusing. At p. 375 we are given a reference to pulsus paradoxus at p. 323; this pulse irregularity is described however not on p. 323 but on p. 303—and the index adds fuel to the fire by referring the reader to p. 302. It is difficult to see what adequate justification there is for referring the reader from Paget's disease of bone (osteitis deformans) on p. 504 to Paget's disease of the female breast on p. 217. At the bottom of p. 518 we read 'spastic paralysis of the upper extremities.....is best illustrated in hemiplegia (fig. 105)' but on turning to the figure in question we find a photograph illustrating inflammatory mastitis of the left breast. We are distressed by our enforced rôle of captious critic but we feel that the errors we have mentioned are blemishes on an otherwise valuable production. Finally, we would ask Dr. Emerson, as a personal favour, to amend in his next edition the Americanised spelling of Scotland's capital which appears at the top of page 12.

J. M. H.

INDIGESTION: ITS DIFFERENTIAL DIAGNOSIS AND TREATMENT.*—By H. G. Paterson, C.B.E., M.C., M.D., M.A. (Cantab.), F.R.C.S., London: William Heinemann (Medical Books), Ltd. 1929. Pp. VIII plus 153. Price, 7s. 6d. net.

IN the preface to this book the author states, "I have endeavoured to present a practical guide to the differential diagnosis and treatment of indigestion." This is a worthy aim, for it is probable that the general practitioner finds more difficulty in diagnosing the cause and directing the treatment of indigestion than he does in any other common complaint.

In the popular textbooks the chapters on diseases of the stomach are perhaps the least satisfactory. They certainly do not help the student to obtain a clear idea of the many causes of dyspepsia and the relative importance of the history and symptoms as an indication for treatment. Mr. Paterson has written his book in a different style.

He gives us a classification which may not be perfect, but is certainly very useful as a basis for the argument of a differential diagnosis. First place is given to indigestion secondary to causes outside the stomach. This is admirable, for there can be no doubt that in the majority of cases the symptoms are not due to any lesion in the stomach itself. Perhaps chronic appendicitis as a frequent cause of indigestion is exaggerated, but Mr. Paterson is a surgeon and to every surgeon the appendix is the *fons et origo* of many disabilities. It may be for a similar reason that in the classification there is no mention of any gynæcological cause, and the reviewer wonders what the gynæcologists will say to this. The importance of obtaining a detailed and accurate history of each individual case is emphasised. In this history the occurrence of pain as opposed to discomfort and its time relation to the ingestion of food is most important of all.

The physical examination must be thorough and complete. Mr. Paterson is an ardent advocate of the value of the test meal and gastric analysis. He states "It is quite wrong to attempt to treat *chronic* indigestion without a knowledge of what is happening in the stomach."

This knowledge can only be obtained examining the contents of the stomach, their chemical composition and the rapidity of its evacuation.

The Ewald test meal, stomach tube and Senoran's evacuator are used by the author, and this method in most cases will give all the information required. But it is surprising to find that no mention is made in this book of Ryle's tube and fractional analysis.

---

* Two copies of this book were received for review, and were inadvertently sent to two different reviewers. As, however, our readers may like to read both reviews, we publish both.—EDITOR, *I. M. G.*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The chapter on radiology is very short. Mr. Paterson agrees that this method of investigation is invaluable, but not infallible. An operation should not be performed on radiological evidence alone, neither should it be postponed if the clinical facts point towards its necessity although unsupported by the radiologist.

The second part of the book deals in sequence with the different diseases of the stomach.

They are all very well described, and the differential diagnosis is unusually clear.

Detailed methods of treatment are not given, neither are there descriptions of operations, but the general outline and the indications for operative interference are very good.

Dr. Paterson is very sceptical of the claims made for the intensive alkaline method of cure. Medical treatment will cure many ulcers, and should always be tried, but he states "The healing of a gastric ulcer is to be measured not by weeks but by months. This truth is based on the evidence of surgical right, and not on that of radiological faith."

There is a useful chapter on general treatment and the use of the stomach tube.

An appendix gives the various tests employed in the analysis of the gastric contents. There is also a list of useful prescriptions and a description of the apparatus required for a simple gastric analysis, that can be used by the general practitioner. The reviewer has not met with any book which gives a more lucid description of the diagnosis and treatment of indigestion. It should prove of great value to both the student and the practitioner.

H. H.

DR. PATERSON'S succinct account of one of the commonest symptoms encountered in medical practice is adequate and timely. An exhaustive consideration of a condition so protean in manifestations and origin as indigestion would require a much larger volume than that under review, and in his attempt to keep the subject strictly within bounds Dr. Paterson has at times drifted dangerously near the reef of dogmatism—this does not however seriously detract from the essential merit of the book.

The author insists that gastric disorder frequently arises from causes outside the stomach; in this connection the vermiform appendix is particularly blameworthy. We should have liked to see a little more detailed reference to the part played by chronic infective conditions of the accessory nasal sinuses and of the teeth in the causation of indigestion. Rosenow in America has recently produced both acute and chronic ulceration of the stomach by intravenous injection of streptococci obtained from lesions of the throat and mouth.

The distension of the stomach by means of an inflating air-pump in order to demarcate the contour of the viscus is not a procedure which meets with favour from all observers. Frequently there occurs a simultaneous distension of the entire intestinal tract with very little distension of the stomach. The technique of auscultatory percussion and of scratching percussion, both useful in outlining the stomach, is not mentioned.

Had this book not been written for practitioners (as opposed to specialists) Dr. Paterson would doubtless have mentioned the use of the œsophagoscope, rather than the less accurate œsophageal bougie, in the diagnosis of stricture of the œsophagus: it would be well, however, to remember the definite exclusion of aneurysm of the arch of the aorta before attempting to use either instrument.

That gastric lavage is the treatment of choice in the majority of cases of acute gastritis admits of little debate, but it appears doubtful whether the treatment in question should be applied in the small residuum of cases where the symptoms are the result of swallowing concentrated mineral acids or strong alkalis.

Dr. Paterson unequivocally condemns gastropexy, colopexy, and other "pexies" as among the most unsatisfactory operations in surgery. In this he is in agreement with another distinguished physician who cynically remarked that "since Waugh discovered the 'mobile ascending colon' the abdominal surgeon has made a fortune hitching up this unfortunate viscus—and a second fortune taking it down again."

The author is to be congratulated on the production of a compact and eminently readable little book which ought to find ready acceptance among practising physicians. Printing and binding are good and the price is reasonable.

J. M. H.

PEDIATRICS FOR THE GENERAL PRACTITIONER.—By H. M. McClanaham, A.M., M.D. London: J. B. Lippincott Company. 1929. Pp. XI plus 606, with 230 illustrations. Price, 25s. net. Obtainable from Messrs. Butterworth and Company (India), Ltd. Price, Rs. 18-12 net.

THE author has written this book for the purpose of presenting a modern clinical picture of the diseases of infants and children under conditions encountered by the family physician.

It represents, to a great extent, his personal experience, first as a general practitioner and then as a child specialist.

The book does not differ in any way from the many textbooks on diseases of children, except that it is written in a more concise and practical style than the majority. The first chapter on the normal human infant is perhaps the best. It gives an excellent description of the normal growth and development, both mental and physical, of a child.

Birth injuries, congenital malformations, and the diseases of the new-born are then described.

The following chapter on "Breast and Artificial Feeding" does not occupy so much space as is usual in books of this kind, but all that is required is there, and the various methods of preparing and modifying artificial foods are clearly explained. The author prefers three hourly feeds to four hourly and advises one bottle feed a day at three months.

The diseases of the digestive and respiratory tracts are the most important in children. The author's description of these is conservative and the methods of treatment advised are practical.

The specific and contagious diseases receive their due share of attention. Miscellaneous diseases include those important conditions due to vitamin deficiency, rheumatism and diabetes. Heart disease and the various diseases of the nervous system occupy a prominent position in the book. Skin diseases, mental defects and tropical diseases are also described.

The last chapter on "Curative Agents" is most practical. All the methods of administering treatment to children are there.

It will be noticed that the whole range of children's diseases is included in one comparatively small volume. This is unusual and makes the book more useful to the general practitioner.

The book is very well illustrated. There is a bibliography after each chapter and a full index.

H. H.

BACTERIOLOGY: GENERAL, PATHOLOGICAL AND INTESTINAL.—By A. I. Kendall, B.S., Ph.D., Dr.P.H. Third Edition. Thoroughly Revised. London: Baillière, Tindall and Cox. 1929. Pp. XVI plus 733. Illustrated with 103 engravings. Price, 31s. 6d. net.

THE reviewer was not previously familiar with this book, of which the volume under review is the third edition, and there appears to be nothing to indicate when the first two editions appeared. However, from the preface one gathers that the more important additions include details of the Kahn test, and the Dick test, and recent work on filterable viruses, especially the bacteriophage.

In view of the fact that bacteriology is a very wide subject, of which medical bacteriology is only a comparatively small specialisation, it is surprising that more writers on the special subject do not give their books a more specific title. The author in this case has qualified his title "Bacteriology" by a somewhat unusual

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

QUININE TROPOSAN

A new quinine-arsenic remedy for Oral Administration in the treatment of Chronic Benign Tertiary Malaria.

Vide Indian Journ. Med. Research, Oct. 1928, Vol. XVI, p. 333.

This new compound is of low toxicity and can be employed with confidence.

It produces rapid abatement of fever with a considerably lower relapse rate after treatment than is the case with quinine alone.

Issued in bottles containing 100 tablets each 0·25 grm.

Prepared in the Laboratories of

MAY & BAKER, LTD., BATTERSEA, LONDON.

Stocks are held in INDIA by:

MAY & BAKER (INDIA), LTD.,

3, Mangoe Lane, CALCUTTA, and Branches.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

DIET IN INDIA

The following striking tribute to the Therapeutic Value of Dimol will appeal to all Medical Practitioners in the East.

"On arrival in this country one commits indiscretions in the way of fruit-eating, cold bathing, etc.

"In a very short time, and for a whole year, I was troubled with recurrent non-amœbic dysenteries lasting about a fortnight at each attack, in spite of diet, bismuth, pulv. cret. arom. c opio, acid sulph. and kaolin. The short intervals between attacks were also periods of dieting... and I had to adopt cholera belts even in hot weather. Cold bathing was taboo.

"I should like to say how grateful I am personally to Dimol; I certainly would not be without it now. It can be relied upon to abort an attack and to limit the period of diet to one or two days. I can now eat forbidden fruits (melons, etc.) *ad. lib.*, discard cholera belts, and enjoy an hour's swimming daily.

"This is my third hot weather, and I have had only one month on the hills."

————, M.B., Ch.B. (Ed.).

After long and thorough investigation, Dimol pulverettes are now supplied by the Admiralty for use in His Majesty's Ships and Royal Naval Hospitals.

DIMOL LABORATORIES, LTD.,

40, Ludgate Hill, London, E.C. 4.

Dimol may now be obtained from all Wholesale and Retail Distributors throughout India.

Digitized by Arya Samaj Foundation Chennai and eGangotri

subtitle "General, Pathological and Intestinal." Of the 700 odd pages only about 60 are on general bacteriology; these form an essential—and in this case a very excellent—introduction to the subject of medical bacteriology. The bulk of the volume is devoted to bacteriology in its relationship to human body, and where the diseases of animals are mentioned, it is only on account of their transmissibility to man. (There may be a few minor exceptions to this statement, as we notice that contagious pleuropneumonia of cattle—a disease not communicable to man—is mentioned.) The final section, which presumably justifies the "Intestinal" of the subtitle, is devoted to the subject of intestinal flora, and the bacteriology of sewage, water, milk, etc.; this section is a very short one consisting of only about 40 pages. The book is thus essentially one on medical bacteriology and is for the general medical student who proposes to sit for the higher examinations.

The usual arrangement is adopted; first the morphology, chemistry, and metabolism of bacteria are dealt with, then their relationship to man as saprophytes and parasites; this is followed by a section on the reaction of the body towards these organisms, that is immunity and antibody formation; in this last chapter are included all the serum diagnostic tests. Special attention has been paid to the Kahn test; Dr. Kahn himself wrote this chapter for the author. There are a few chapters on cultural methods and laboratory technique. The various pathogenic bacteria are then described in detail; the spirochætal group of organisms are included here. There is a chapter on the higher bacteria, the Trichomycetes, moulds, etc. Only a few pages are devoted to filterable viruses; poliomyetitis and encephalitis lethargica receive most attention, whereas the bacteriophage is dismissed in a couple of pages; this is disappointing in view of the reference to this subject in the preface. Rabies is included under diseases of unknown ætiology and is not dealt with at any length; no attempt has been made to describe the different methods of giving anti-rabic treatment, and the statement that the neuro-paralytic symptoms, which have followed when big doses are given, are a modified form of the disease is not in accordance with the generally accepted opinion.

The book is of very convenient size, the type is clear and the page illustrations are excellent and not too profuse. The coloured plates are, however, disappointing and might well be omitted from future editions. It is difficult to justify plate III, for example; coloured plates add considerably to the cost of a book and this one could not possibly be of any assistance to the reader. This is, however, the only criticism we have to make and we think that the publishers, as well as the author, should be congratulated on the production of the book, which we can thoroughly recommend as a textbook for the student for higher degrees and for the laboratory worker.

L. E. N.

PHYSICAL THERAPEUTIC TECHNIC.—By F. B. Granger, A.B., M.D. With a foreword by W. D. McFee, M.D. Philadelphia and London: W. B. Saunders Company, Ltd. 1929. Pp. 417. Illustrated. Price, 30s. net.

IT has been a great pleasure to the reviewer to read this book, which deals with a subject which has few really authoritative textbooks. The present volume is therefore welcome.

The author has successfully covered the ground of physical therapeutics from the electrical standpoint, and deals with all forms of therapeutics, such as diathermy, ultra-violet rays, infra-red rays, galvanism, faradism, the Morton wave, static electricity, and the sinusoidal current. He also touches on *X*-ray therapy.

It is interesting to notice that the author favours the metal to skin contact for diathermy in opposition to the general practice in his own country. This method is universal, practically, in England. The type is clearly printed, the book is well illustrated, and indexed. Altogether, this work can be recommended not only to specialists, but also to general practitioners, who desire to know something of electro-therapy.

C. G. R. M.

AIDS TO ZOOLOGY.—By H. Lister, M.Sc., F.Z.S. London: Baillière, Tindall and Cox. 1929. Pp. VIII plus 214, with 29 figures in the text. Price, 3s. 6d. net.

THIS little book on zoology for young students covers a large field in a very short compass. The author should be heartily congratulated on having been able to deal with so much matter in a concise manner and in such simple language. The author's method of reproducing diagrams by the use of words only seems to be very simple and instructive; but we feel that a few more diagrams would have been helpful. The book, however, will not be suitable for Indian students, whether intermediate or medical, owing to the fact that Indian syllabuses are quite different from European, and most of our types equally so.

E. K. G.

AN INTRODUCTION TO THE HISTORY OF MEDICINE.—By F. H. Garrison, A.B., M.D. Fourth Edition. Revised and Enlarged. London and Philadelphia: W. B. Saunders Company, Ltd. 1929. Pp. 996. Illustrated. Price, 55s. net.

THIS book is one of the largest and best-known books on the history of medicine. No very remarkable additions have been made in this new edition, but the subject-matter has been brought up to date.

The first chapter is by way of being an introduction; in it the relationships of the ancient medicines to modern medicine is discussed. In the succeeding chapters the subject is dealt with chronologically. The prehistoric period, of which our knowledge is necessarily very scanty and dependent largely on paleopathological remains, is given a short chapter. There are then chapters on Egyptian Medicine, Sumerian and Oriental Medicine, and Greek Medicine, and then on the various periods, the Græco-Roman, the Byzantine, the Mohammedan and Jewish, and the Mediæval, through which the cult of medicine passed before arriving at the stage of modern scientific medicine, which may be said to have had its earliest beginnings during the Renaissance. The seventeenth and eighteenth centuries, during which little advance was made, are each given a chapter. The Modern Period which occupies about half the volume is divided into two chapters "The nineteenth century; the beginnings of organised advancement in science," and "The twentieth century; the beginnings of organised preventive medicine." Finally, the book proper concludes with a chapter on medicine in the world war and after.

The first three hundred pages, which take us up to the end of the seventeenth century, are written as a history and make most excellent reading, though the student of the ancient Indian systems may be disappointed to find that only two pages are devoted to this subject. The rest of the book has degenerated into a sort of dictionary of medical biography. The historical sequence has been observed as far as possible, and an attempt has been made to group and to make a consecutive story out of the various biographies. This is probably the only possible way of dealing with the subject in a book of this size, which aims at being a complete history and not merely an historical sketch. It certainly increases its value as a book of reference, though it makes it somewhat tedious to read.

There are a number of appendices. The first appendix is a chronology of medicine and public hygiene. Here the writer has observed the natural perspective; in the first page he gallops through about 7,000 years, whereas in the last few he crawls at the rate of about two years to the page. The crawling process is rather laboured in places. We quite see the author's difficulty; not only is he afraid to leave out any event in case at some future date it may be considered an important one, but he has to please his contemporaries by bringing in as many of them as possible. Nevertheless, we feel that posterity will be able to view quite dispassionately the fact that between 1898 and 1915 W. T. Porter financed the *American Journal of Physiology*, that in 1917 mental tests were

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

employed in recruiting soldiers, and that Ruth Tunnicliff discovered a diplococcus in measles, that in 1920 an institute for albumen research was founded in Hamburg, and that in the following year the New York Health Department operated 68 infant milk depôts. Also, it is rather difficult to see how the fact that St. Petersburg became Petrograd in 1914 and then in 1922 became Leningrad can be considered an important medical event.

The book is an important one; it is essential to the serious student of medical history and it should find a place in every medical library of any standing. The format of the book is excellent.

L. E. N.

PRINCIPLES OF PATHOLOGY FOR PRACTITIONERS AND STUDENTS.—By H. D'Arcy Power, M.D., F.R.P.S. and William W. Hala, M.D. New York and London: D. Appleton and Company. 1929. Pp. XLIX plus 787, with 298 illustrations. Many of them in colour. Price, 42s. net.

THIS is a new book on pathology. In the preface the authors explain their reason for adding to the long list of books on this subject. They feel that the writers of most books on pathology do not sufficiently stick to the point and are liable to be diverted into the realms of parasitology. This, they think, is as much outside the province of pure pathology as a discussion on predatory mammals in a book on surgery. The reviewer has never noted this as a serious defect in the books that have come his way. They also feel that "pathology.... is greatly hampered by a superabundant, overlapping and often misleading nomenclature," and that "there is very little that cannot be said in plain English, and that is how we prefer to say it." They may have, done so, but they have spelt it in plain American. They have given few bibliographical references because "any real bibliography would consume more pages than those given to the text." This is quite true, nevertheless we cannot help feeling that at least 40 of the 42 pages which have been wasted—in our opinion—in printing a detailed list of contents and illustrations might have been with great advantage devoted to a selected list of references. A short contents list of a page or so is very useful, but one of this length is superfluous; its functions are performed far more efficiently by an index.

The subject is divided into two parts, general pathology and systematic pathology. In the first part there are successive chapters on the various forms of cell found in the body and on the degenerative and regenerative processes they undergo, on inflammation, causes of disease, defence processes, developmental errors, and cysts and neoplasms. In the second part each system is dealt with separately. Finally, there is an appendix, part of which is devoted to technique and the rest to a various assortment of subjects, from the theory of cell heredity to the sedimentation of erythrocytes.

The book is written in a clear and simple style. There are numerous very useful illustrations. It should make a useful textbook for the M.B. student in this country. The print is clear, the paper of good quality, and most of the illustrations are excellently reproduced.

L. E. N.

TOXÆMIAS OF PREGNANCY.—By H. J. Stander (Medicine Monographs). Volume XV. London: Baillière, Tindall and Cox. 1920. Pp. XI plus 161 Price, 13s. 6d. net.

THIS monograph is a monumental piece of work, reviewing as it does every considered opinion on the above subject in 140 pages. Some idea of the work done by the author can be given when it is stated that there is a bibliography of 735 names, most of whom are continental, but one wonders if the author has ever visited the clinics of some of the authorities he quotes, for the findings of horn-spectacled professors in laboratories cannot be compared with those who base their deductions on the pathology of the living.

Dr. Stander however writes without bias, and having stated multitudinous theories, always gives us the benefit of the experiences and deductions found at Johns Hopkins Hospital. The toxæmias of pregnancy are classified by him as—

(1) Vomiting of pregnancy.
(2) Low reserve kidney.
(3) Nephritis complicating pregnancy.
(4) Pre-clampsia.
(5) Eclampsia.
(6) Acute yellow atrophy of the liver.

This classification has been followed at his hospital and has proved satisfactory, for less than 5 per cent. of patients suffering from toxæmia of pregnancy have been placed in an unclassified group.

It is necessary to understand what is meant by the low reserve kidney, for this is a title which so far has not been used by British obstetricians, although it is a clinical entity that has been acknowledged by James Young, Gibberd and others in Great Britain, namely, (*a*) a clinical status of somewhat elevated blood pressure, (*b*) the amount of albumen is not excessive, and disappears after childbirth, (*c*) in subsequent pregnancies the patient's condition does not become aggravated, and the kidney is not permanently injured, (*d*) there is a reserve of capacity in the glomeruli of the kidney which enables them to maintain function up to about the eighth months of pregnancy without symptoms, and which is completely restored after the birth of the child.

This group of cases forms about 40 per cent. of the albuminurias of pregnancy, and is a very important one from the point of view of prognosis and treatment; for the state of pregnancy itself is the most delicate test of renal function that we possess. Therefore, before subjecting any such patient with albuminuria to emergency treatment, such as Cæsarean section, or induction of labour, it is imperative that the blood-urea concentration and the urine-urea concentration should be assessed in ratio.

Eclampsia has been called the disease of theories, and Dr. Stander certainly gives us evidence thereof, for he tabulates *seriatim* and criticises twenty-one present-day theories of causation, but clinically we are no nearer the light than we were ten years ago from the point of view of treatment, for the combined methods of Stronganoff, Tittus, and Hastings Tweedy still hold the field.

The biochemical findings indicate that eclampsia is seldom associated with nitrogenous retention in the blood, or that the blood-urea nitrogen is raised. Dr. Stander is of opinion that elevation of the non-protein nitrogen is the result of kidney injury caused by the eclamptic outbreak, and that the blood sugar is either normal or slightly increased.

He states that an increased uric acid and decreased carbon dioxide combining power are the outstanding findings in the blood chemistry. One interesting point is brought out, and that is that during the World War owing to a hunger blockade of the Central Powers with resulting deprivation of proteins and fat, the incidence of eclampsia fell from 1 in 70 to 1 in 118, which would indicate that semi-starvation or a carbo-hydrate diet were beneficial in Europe; but against this theory we have the immense incidence of eclampsia amongst Hindus in India, whose diet is mainly carbohydrate. It is possible that the incidence in India then, is due to the excess of ghee and vegetable fats used in the preparation of their food, such fats inhibiting the proper function of the liver and hence determining the accumulation of some unfilterable toxins which precipitates eclampsia.

Herein lies a line for research which it is hoped the Rockefeller Foundation in Calcutta will hasten to take up in the near future for, barring Russia, the incidence of eclampsia in India is greater than in any other country of the world.

This monograph of Dr. Stander is one that every professor of obstetrics and practising obstetrician should possess.

V. B. G-A.

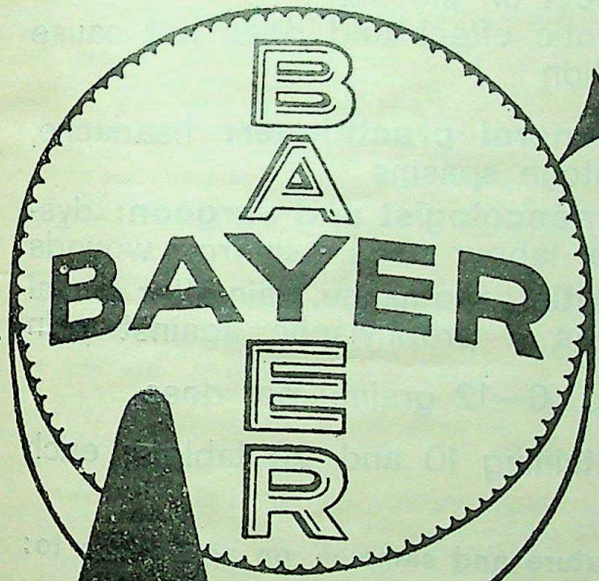
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Prescribe the original

BAYER'S ASPIRIN

which was created 30 years ago and has yielded excellent results in millions of cases.



Pay attention to:

the rapidity and completeness with which it disintegrates in water to a fine powder of quite a weak acidulous taste,

the freedom of smell,

the excellent manner it is borne by the patients,

the reliability of the desired effect.

ASPIRIN

Literature and full particulars on application:

HAVERO TRADING Co., Ltd., CALCUTTA,

Pharmaceutical Dept., *Bayer-Meister Lucius*

P. O. Box No. 2122, 15, Clive Street, CALCUTTA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Special advantages: 1. intensive rapid analgesic effect
2. no ill effect on the heart
3. no hypnotic effect and does not cause perspiration

Indications: **For the general practitioner:** headache, neuralgia, stone spasms
For the gynaecologist and surgeon: dysmenorrhoea, labour pains, pain from wounds
For the dentist: toothache, pain after dental treatment, as a prophylactic against pain

Dosage: 1—2 tablets (6—12 grains) per dose

Original packings: Tubes containing 10 and 20 tablets, each 6 grains.

Medical men gladly supplied with literature and samples, on application to:

SCHERING-KAHLBAUM (INDIA), LTD.

Telephone: Cal. 4770
Telegrams: Aeskulap

CALCUTTA

4, Dalhousie Square,
P. O. Box No. 2006.

T. M. THAKORE & CO.,
Bombay: 24, Churchgate St.
Madras: P. O. Box No. 249.

MALLIK, THADHANI & CO.,
Karachi: Central Bank Buildings, P. O. Box No. 164.

F. SCHWERZMANN & CO., Rangoon (Burmah):
26, Merchant Street.

12037601

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

HERMAN'S DIFFICULT LABOUR: A GUIDE FOR STUDENTS AND PRACTITIONERS.—By Carlton Oldfield, M.D. (Lond.), F.R.C.S. (Eng.), F.R.C.P. (Lond.). Seventh Edition. Revised. London: Cassell and Company, Ltd. 1929. Pp. XII plus 560, with 8 radiographic plates and 197 illustrations in the text. Price, 16s. net.

THIS book takes one back to student days when no candidate dared sit for examination without a thorough knowledge of Dr. Herman's work, and although during thirty years' popularity much has been added to the science and technique of obstetrics, the clinical fundamental facts of midwifery remain the same. Mr. Oldfield must be congratulated for maintaining and emulating the concise and picturesque literary manner of the original author, and for bringing the book up to date, whilst maintaining many of its dear old classical illustrations which find a place in the heart of all English obstetricians.

Far be it from us to criticise conservative and non-middlesome midwifery, but we would suggest that in the next edition a section should be devoted to the position of Cæsarean section in regard to occipito-posterior presentations, for no mention is made of this. We admit that trial labour has its advocates, but the recent statistics of "failed forceps," collected by Miller, Hendry and Fletcher Shaw which comprise 54 maternal and 332 fœtal deaths, make us pause for breath, for the detailed summary of their findings illustrates the fact that 16 of the maternal and 100 of the fœtal deaths were due to occipito-posterior positions.

We are of opinion that both in private and in hospital practice these presentations are a source of far more tragedies than is generally recognised. Therefore it is up to professors of obstetrics to teach that Cæsarean section, preferably by the low method of De Lee, is at times indicated, provided the fœtal heart sounds are healthy. In these days of limited families if the first baby is in the right occipito-posterior position and born dead, it is not uncommon for the practitioner to cover himself by suggesting that further pregnancy should be avoided, and the psychological effects of birth tend to accentuate the doctor's advice, greatly to the prejudice of humanity.

Every professor in touch with general practitioners will bear out the fact that private patients frequently make these statements, therefore it should be generally known that the lower uterine segment Cæsarean section can be done with safety, even late in labour, and that such a Cæsarean does not mean the necessity of section at the next confinement, for if the pelvis is normal efficient ante-natal care and intra-natal skill will mean easy delivery *per vias naturales*.

We note with regret that Mr. Oldfield gives no detailed description of the low Cæsarean operation of De Lee, although there is hardly a hospital obstetrician throughout the world, who does not perform this operation in preference to the old eventration method described by him on p. 476 in detail. The reviewer up to 1924 having done scores of these eventration Cæsarean sections at the Eden Hospital, Calcutta, in septic or potentially septic cases, with a lamentable maternal mortality, has entirely given it up since seeing Dr. De Lee's operation in Chicago. Eighteen septic cases have been operated upon with 1 maternal death, the wound being drained suprapubically in all cases where the membranes have ruptured, and more than three examinations been made. The experience at the Rotunda Hospital has been the same. We trust therefore that in the next edition due prominence will be given to the virtues of the cervical Cæsarean section, together with an illustrated description.

Another smaller criticism we would make is that the description and illustration of that terrible instrument the Bossi dilator be omitted, and that if for historical reasons the author decides to include the description and picture of Walcher's position, a headline note will be made that he trusts that this method for the use of high forceps will never be put into practice, for surely the most hardened opponents of Cæsarean section are all agreed that high forceps delivery is to-day almost akin to malpraxis, seeing that the infantile mortality, and maternal morbidity thereafter are outrageous, as compared with Cæsarean section. We are sure that Mr. Oldfield does not use it himself and that he teaches that the high forceps application and Walcher's position are as dead as the Dodo.

These minor criticisms of a clinician should not in the least detract from the general excellence of the book, for which the reviewer has had constant affection for twenty-five years. It is a book that every professor and consultant reveres.

V. B. G-A.

Annual Reports.

SIXTY-FIRST ANNUAL REPORT OF THE DIRECTOR OF PUBLIC HEALTH OF THE UNITED PROVINCES OF AGRA AND OUDH; FOR THE YEAR 1928. BY LIEUT.-COL. C. L. DUNN, C.I.E., D.P.H., I.M.S. ALLAHABAD, SUPDT., GOVT. PRINTING. PRICE, RS. 4.

THIS voluminous report contains a mass of vital statistics, but also much epidemiological information and interesting writing. According to the 1921 census the population concerned is 45,375,787 and the provinces cover an area of 107,167 square miles. Registration of vital statistics is still far from good, though every attempt is made to reform it, even including lectures to mortuary clerks of all *thanas* at *tahsil* headquarters. The birth rate for the year was 38.24 and the death rate 24.15; in other words, there is a steady increase of population in this, the most densely populated part of India, despite diseases and epidemics. The provincial infant mortality was 159.90 for the year. The municipal infantile mortality was 255.81; that in urban areas 252.67 as against a rate of 151.34 in rural areas. This difference seems surprising, but may be due to more careful registration in urban areas, to some extent. One of the greatest difficulties which the Public Health Departments all over India have to contend with is that the fines inflicted for neglect to comply with the registration rules are ludicrously inadequate; thus during the year a total sum of Rs. 1,109 only was realised from 2,294 persons so fined.

Turning to the principal diseases, *cholera* was more prevalent than in 1927; a death rate of 0.99 per mille as against one of 0.62 in the previous year. Anti-cholera inoculations totalled 60,880. The disease was prevalent in 16 districts out of 48. An interesting chart is given showing the periodicity of cholera in the United Provinces; whilst this periodicity is not quite regular, yet marked waves of increased incidence can be noted on it every third or fourth year. Infection appears to be imported in connection with every outbreak recorded. The relative failure of the monsoon was the chief contributory cause for the increased prevalence of cholera during the year; and the department had a very heavy year's work in connection with this disease.

Smallpox, on the other hand, was less prevalent, a death rate of 0.07 as against one of 0.17 for the previous year. *Plague* accounted for a death rate of 1.78 as against the quinquennial average of 1.11. Muzaffarnagar and Ghazipur districts were chiefly concerned. The death rate from *fevers* was 16.88, as against the quinquennial rate of 18.77. The Anti-tuberculosis League at Lucknow is doing good work, whilst Dr. Sousa carried out an investigation into the prevalence of tuberculosis in the schools in Lucknow. He also found Almora, a most popular hill station, to be badly infected. *Dysentery and diarrhœa* gave a provincial death rate of 0.29, the maximum being in May; *respiratory diseases* were responsible for a death rate of 0.75 as against a quinquennial average of 0.61. It is probable that the reported returns for dysentery, kala-azar and pneumonia are much below the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

actuals, and those for malaria, smallpox, plague and relapsing fever are in excess. A table for nine years' verification of mortality returns shows that only cholera, smallpox, and plague are reported by the village chaukidars with any degree of certainty.

Section VII of the report gives a triennial review of vaccination in the provinces from 1926 to 1929. There were 3 officers in charge of ranges and 50 assistant superintendents of vaccination on duty. The average annual number of vaccinations works out at 1,484,111. Success is attained in 94 per cent. of primary vaccinations, and 52 per cent. of re-vaccinations. A most interesting diagram shows the relative proportion per 10,000 persons in each district of the deaths from smallpox to the number of persons protected by vaccination. This shows wide variations in different districts. It is proposed to make vaccination compulsory in the rural areas, and a Bill to this effect is before the Legislative Council.

Section IX shows that regular bacteriological and chemical examination of water supplies is carried on throughout the provinces. The new Provincial Hygiene Institute was officially opened by H. E. the Governor on December 8th, 1928.

Dr. A. N. Goyle continued to carry out research work on plague under the Indian Research Fund Association. The conditions under which plague "carries over" from one epidemic season to another appear to be diverse. In very humid localities, such as Ballia and Azimgarh, fleas on rats will remain more numerous, and the chances of successful carrying over be greater. A much larger number of villages carry over in the western districts where the climate is more humid, than in the drier eastern districts. Villages infected late in the season are much more apt to carry over than those infected earlier. A carry over in a very small number of villages is sufficient to establish widespread epidemic conditions in the next epidemic season by importation of the infection.

The cholera research enquiry under the Indian Research Fund Association was brought to a conclusion during the year. Colonel Dunn is no believer in the hypothesis of the conversion of the non-agglutinating into the agglutinating vibrio; the whole of the evidence in the United Provinces is that every outbreak begins with a fresh importation of infection. Hardwar is often blamed as being an epidemic focus of cholera; this is not true; the infection is always imported, whilst under favourable conditions the true cholera vibrio may live for a week or even longer in Ganges water.

A special activity of the department during the year was the preparation of cinema films on health matters for propaganda purposes, and copies of these were sent to the League of Nations' Health Section by request. A public health exhibition was also held at King George's Medical College, Lucknow, in January 1928, in connection with the visit of the League of Nations' interchange of health officers.

Three post-graduate courses of instruction in malariology were given during the year, and 30 officers trained for this work. Anti-malarial investigation was continued in the Terai, and recommendations carried out. (This most important work in so notorious a malaria area was first begun some years ago by Lieut.-Col. J. A. S. Phillips, I.M.S.; nothing with regard to it has been published in the journals; but the results are beginning to tell.) The Sarda Canal is also another important area where full malaria control is in force. Experimental schemes are being tested out in rural areas, such as the use of larvæ-eating fish, free distribution of cinchona febrifuge, and even utilizing the services of the Seva Samiti boy scouts to help in anti-malaria campaigns. Clover and cactus are both under trial; also the issue of cinchona febrifuge to febrile children in schools, and the treatment of village tanks. Malaria surveys were carried out in ten rural areas and five urban areas. Quinine pills were tested. It is true that much of this big and successful organisation's results are not published; but on the other hand, financial grants can sometimes be obtained for schemes for "general sanitary improvement," whereas grants for specific anti-malarial measures might be refused.

Plague.—Plague was responsible for 80,943 deaths during the year, a very marked increase on the four previous years; though almost insignificant when compared with the 1905, 1907, and 1911 epidemic years. Evacuation is the most popular measure; but the lesson needs to be driven in that evacuation should begin at the first sign of rat mortality, and not be delayed until the super-imposed human epidemic has set in. Anti-rat campaigns were on trial in twelve municipalities and five towns; the Hindu opposition to this measure has entirely ceased. Travelling dispensaries, readily mobilised, are reported to be very valuable in the campaign against plague.

Hygiene propaganda is the subject of a special department; and has been very vigorously carried on during the year. The district health service was extended to the Naini Tal area; it has now acquired the status of popularity and requests for its installation in further areas are noted. Pp. 60 to 65 of the report record the unanimous approval of deputy commissioners and others on this organisation, and the value of its work. A village aid scheme for rural villages was instituted in August, 1928. Model villages are being constructed in Gonda district. In all 751 applications were made for sanitary schemes in notified areas, estimated to cost Rs. 9,00,000; in reply water-supply schemes received priority, and a total sum of Rs. 71,743 was allotted. The Provincial Village Sanitation Act was extended to 85 villages during the year, and is now in force in 768 villages in all.

A detailed report of the work in different districts follows. The work of the Public Analyst has increased from 77 specimens in the year 1915 to 1,938 in 1928; this department is now housed in the chemistry department of the Lucknow University, but further accommodation will certainly be wanted. Maternity and child-welfare work was active throughout the year in all parts of the provinces. Pp. 116 to 118 deal with the result of medical inspection of schools.

The report also includes the Thirty-Fourth Annual Report of the Superintending Engineer, Public Health Department, United Provinces for the year 1928-29.

There is a wealth of statistical and epidemiological information in this report which will be of importance to public health workers in India. Its chief feature, however, is to emphasize—unconsciously—how widespread and energetic is public health work in the United Provinces.

ANNUAL REPORT ON THE ADMINISTRATION OF JAILS OF THE BENGAL PRESIDENCY, 1928. BY LIEUT.-COL. W. G. HAMILTON, I.M.S., CALCUTTA, BENGAL SECRETARIAT BOOK DEPOT. PRICE, RS. 13-2-0.

WE regret that this is Colonel Hamilton's last annual report, as he has recently gone on leave prior to retirement. His interest in jail problems has always been intense; he has introduced may much-needed reforms in Bengal; whilst his whole attitude towards the prisoner population has always been that of a physician and a student of penology. Above and beyond all, his constant efforts towards getting short-term sentences done away with, towards the organisation of After-care Associations, and towards a Children's Act and a Borstal scheme, are notable.

This report is in itself so much by way of a summary, that we may abstract from it, rather than attempt to review it.

"The principal event affecting the Jail Department in 1928, was the improvement of pay of the warder staff. This was long overdue and I am very grateful for the liberal increase sanctioned by Government and voted by the Legislative Council in August. Warders now receive the same pay as the Armed Police, the substantial rise of Rs. 6 per mensem should now attract a better type

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The problem of

Maternal Mortality

It is now recognised that the maternal mortality rate is intimately associated with the incidence of puerperal septicæmia, and, in view of this, recent results (*B.M.J.*, June 1st, 1929, p. 984) disclosing the fact that puerperal sepsis may be cured simply by the administration of therapeutic doses of

RADIOSTOLEUM

have opened up "*a vista of rich promise*" to all who are concerned with the problem of maternal mortality.

Literature containing particulars of dosage will be sent on application to the B.D.H. resident representatives in India:

HENRY S. CLARK
8/10 Waterloo Street
CALCUTTA

BYRAM MISTRY
Graham's Buildings
Parsee Bazar Street
FORT BOMBAY

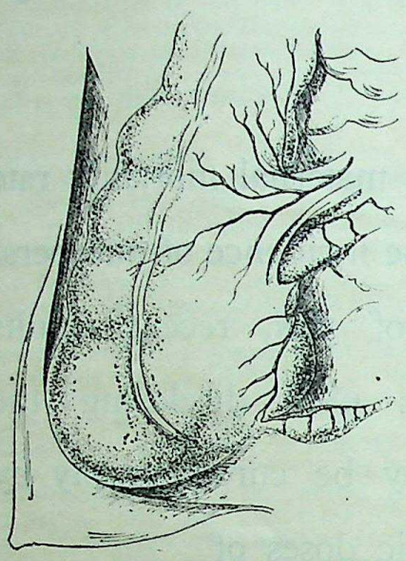
THE BRITISH DRUG HOUSES LIMITED
LONDON

Vit.Pr./In·2912

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Among the Results of Constipation



Distended and sagging cæcum compressing and obstructing blood supply of vermiform appendix.

are not only the grave toxæmias of which much has been learned in recent years, but also conditions arising from mechanical factors, due to displacement of the viscera or pressure exerted by the distended bowel.

AGAROL, combining three essential actions: lubrication of the intestinal tract, restoration of the peristaltic force, and softening of the impacted fæces, generally aids in overcoming the effects of constipation. Gentle but forceful in action, Agarol assists the organism back to regular normal evacuation by restoring *peristaltic function*.

The dependability of Agarol has definitely enlisted the interest of the medical profession, who in most cases of acute or chronic constipation, successfully prescribe Agarol — one tablespoonful on retiring.

Agarol is the *original* Mineral Oil — Agar-Agar Emulsion with Phenolphthalein and has these advantages:

Perfect emulsification; stability; pleasant taste without artificial flavouring; free from sugar, alkalies and alcohol; no oil leakage; no griping or pain; no nausea; not habit forming.

WILLIAM R. WARNER & CO., INC.
Manufacturing Pharmaceutists Since 1856,
113-123 WEST 18th STREET,
NEW YORK CITY.

Agents in India:—
MARTIN & HARRIS,
8, Waterloo Street, Calcutta;
119, Parsi Bazar Street, Fort, Bombay;
and 20, Sunkurama Chetty Street, Madras.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of recruit. I regret to say that the housing conditions of the warders are deplorable, the barracks are ill-ventilated and there is overcrowding in all warders' barracks. New quarters are essential, but I fear that funds will not be available as long as the present financial condition of the Presidency continues. The number of family quarters for warders is quite inadequate, a minimum of 33 per cent. should eventually be provided for.

The Borstal Act came into force on January 1st, 1928, but magistrates have not availed themselves of this valuable alternative to imprisonment as much as had been hoped for. They still apparently prefer to send lads to prison with short terms of imprisonment, rather than give them the benefit of a long training in the Borstal School; it is mistaken kindness to give short sentences of imprisonment, as it usually means that a lad becomes a criminal for life if he once has the misfortune to undergo a term of imprisonment, and mix with confirmed malefactors. The Borstal Institution at Bankura has made some progress during the year, the results of the educational classes have been very hopeful, the District Inspector of Schools gave a satisfactory report at his first inspection. Technical training in carpentry, book-binding, smithy works, weaving and tailoring is carried out and the inmates have turned out some useful work. They now make their own clothing and the institution will supply all jails in Bengal with galvanised iron buckets. Government recently sanctioned rules for the management and control of the institution and a Visiting Committee has been appointed The grade system has been started, and it is hoped that it will prove a success. Well behaved lads now play football and hockey outside the institution walls. Government have sanctioned the construction of a new playground for the institution; the work will be carried out by the inmates. Route marches have been started in the neighbourhood of the school. The newly conceded privileges have so far not been abused.

The success of the Borstal system largely depends on an effective After-care Association which will look after the interests of the discharged inmates. The Bengal After-care Association for Juveniles and Adolescents has done good work since it was founded in March, 1928: the Association is fortunate in having the Chief Justice of Bengal, the Hon'ble Sir George Rankin, as its President; he is supported by an energetic executive committee of leading Indian and European ladies and gentlemen. After-care work deserves generous support from the public. In this connection it is interesting to read the remarks of Sir Ernest Wild, K.C., Recorder of London, at the Central Criminal Court on March 1st, 1929: "I know the difficulty of discharged prisoners getting work, but we cannot blame the After-care Societies. The whole blame rests on the community. If they would only recognise that the money is well spent and is a good insurance against crime, and would subscribe more, better chances would be given to discharged prisoners and less crime would be committed." A successful district After-care Association has been started in the district of Tippera; it has been able to get the co-operation of the Union Boards as recommended by the Pearson Committee. Dacca and Mymensingh districts have also started after-care work. I hope in time every district in Bengal will follow suit. I am convinced that the surest way to reduce the population of our prisons is to treat juvenile delinquency on rational lines and provide efficient after-care during the critical period after discharge from reformatories, Borstal institutions or prisons.

It is very unfortunate that the Bengal Children Act, 1922, is still not in force outside Calcutta; young children are sent to jail for trivial offences in every district; it is to be hoped that it will be possible to provide funds to extend the Act over the whole Presidency. Remand homes and certified schools under the Act will have to be provided, but the ultimate benefits should more than justify the extra expense.

Lunatics.—The question of providing accommodation for lunatics in Bengal has been a serious problem during the past year. The Indian Mental Hospital, Kanke near Ranchi, which takes in lunatics from Bengal, is grossly over-crowded and it has been impossible to find accommodation for certified lunatics in that institution. The result is that many dangerous and troublesome lunatics have had to be kept in various jails. The number of separate cells is notoriously inadequate in the jails of Bengal for disciplinary purposes; at the present time they are mostly occupied by certified lunatics, both non-criminal and criminal, and by confessing under-trial prisoners; the Superintendents are, therefore, deprived from using them for their intended purpose. Jails are obviously unsuitable places for treating mental diseases: there is no skilled attendance or nursing available, and the results on the unfortunate patients must be very detrimental to their chance of recovery. The practice of sending non-criminal lunatics to jail for observation or treatment is quite indefensible; this system was severely criticised by the Indian Jails Committee, 1920, in their report; unfortunately the position is worse now than previously, owing to lack of sufficient accommodation at the Indian Mental Hospital.

An expert alienist is needed in the Jail Department who could give advice on the many questions which occur in connection with weak-minded and insane inmates of our jails.

Weak-minded prisoners.—There is a considerable number of prisoners in jails who are a trouble to the authorities and to themselves; they are not insane enough to be certified as lunatics, but are mentally defective and not wholly responsible for their actions. They are constantly getting into trouble for short work or for frequent breaches of jail discipline; they are exploited by bad character prisoners for their own ends. They were scattered in small numbers in most jails. I have concentrated them all in one place where they can be observed and treated on suitable lines. They are now confined in Berhampore Jail; cases suitable for transfer must be personally certified by the medical officer of the jail before they can be admitted to Berhampore.

Leper prisoners.—I am glad to report that funds have been allotted for the extension of the Leper Jail at Midnapore. Of late years the number of leper prisoners has increased and the accommodation at Midnapore Central Jail was quite inadequate. I hope the work will be completed within a few months' time and all lepers awaiting accommodation in other jails will be transferred to Midnapore.

Short-term prisoners.—The problem of the short-term prisoner still remains unsolved; the remarks I made in my last report still hold good. The Presidency Jail is the principal sufferer; a very large number of people arrested on "suspicion" under section 54, Criminal Procedure Code, are sent to this jail. Long detentions in hajat for trivial offences are too many, especially in the mufassal. I recently had reported to me the case of a youth who was charged with travelling without a railway ticket; his case was not to be taken up until after he had been in jail for eight days; he had never been in jail before and was thus brought into contact with bad characters with the possibility of becoming a confirmed criminal.

In this connection I would mention that Union Boards committed 11 persons to jail in 1928 with sentences ranging from 3 days' simple imprisonment to 7 days' rigorous imprisonment. This number will probably go up in time. I need hardly stress the undesirability of such short sentences and their most injurious effect on the persons concerned. Such sentences are contrary to the recommendation of the Indian Jails Committee, made in paragraph 444 of their report to the effect that sentences of imprisonment under 28 days should be prohibited. The possibility of introducing a system of labour in lieu of imprisonment similar to that in force in Egypt, as described in paragraph 444A of the above report, might be considered for such cases.

Classification and separation of prisoners.—Owing to the obsolete construction of most jails in Bengal, it is impossible to properly segregate various classes of prisoners from each other. Advanced schemes of reformation have been possible in the prisons of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

United Kingdom and other countries by completely segregating first offenders and "star" class prisoners from habitual criminals. As long as the convict officer system on its present lines is in force, I do not see how a strictly class system can be introduced in most jails in Bengal, but a proposal has been put up to Government for converting one central jail into an habitual jail, where all well known bad characters and recidivists could be concentrated. I hope it will be possible to find money for this important reform as soon as possible.

Difficulty of securing orders from Government departments.—I wish to bring to the notice of Government the difficulty of securing orders from Government departments for the Jail Department. It is only with the greatest difficulty that we can secure work to keep the prisoners suitably employed throughout the year. The Jail Department is in a position to supply textile goods, blankets, furniture, durries, etc., to the various consuming departments of Government, but in many cases orders are given to outside contractors for articles at higher prices than those quoted by the Jail Department. If the quality of articles tendered by the Jail Department is as good as that of private contractors, and the price is not higher, I think the Jail Department should be given the preference.

The Jail Department has in some cases got contracts from the East Indian Railway, Eastern Bengal Railway and Bengal-Nagpur Railway, but in several instances large orders have been given to contractors for articles at a greater cost than those quoted by the Jail Department. I know that railways are under no obligation to obtain goods from jails, but provided that the price is not higher and the quality not inferior, and that the Jail Department is in a position to fulfil the contract in due time, I think Government railways should support the Jail Department if possible.

As recommended in paragraph 59 of the Indian Jails Committee's Report, 1919-20, a recreation room for the jail staff should be provided in each jail, and Government should sanction a grant for the purpose annually. Arrangements for recreation should also be made for prisoners as recommended by the Indian Jails Committee in paragraph 275 of their Report. Lectures and lantern demonstrations on instructional subjects should be provided for good-conduct prisoners. The Inspector-General should be empowered to incur an expenditure not exceeding Rs. 25 per jail per annum on the purchase of magic lantern slides, as in Madras. Besides being instructive, this should have some effect on the reformation of prisoners.

Another important need is a juvenile jail for the confinement of juvenile and adolescent prisoners who are not sent to Reformatory and Industrial Schools and the Borstal School, or who are not fit for these institutions. As recommended by the Bengal Jails Enquiry Committee, 1927, a permanent juvenile jail should be started in the site of the old Mental Hospital at Dacca as early as possible.

The experimental scheme of primary education for young prisoners in Alipore Central Jail has continued to be a success, and Government have sanctioned money to continue the classes for the coming financial year.

In my opinion these classes should be introduced into all central jails for prisoners under 25 years of age.

The young Indian prisoner has been found very anxious to learn the elements of reading, writing and arithmetic. I consider education to be the most reformative influence in a jail. It has been found that offences against discipline have greatly diminished amongst young prisoners attending educational classes.

Advisory Boards for the premature release of prisoners eligible under the rules were held half-yearly in each of the five Central Jails. One hundred and sixty-five prisoners were brought before the Boards; of this number 103 were recommended for release, cases of 62 prisoners were rejected or deferred. Government eventually released 93 of those recommended.

Judicial statistics.—The following table shows the number of prisoners of all classes who passed through the jails and subsidiary jails of this Presidency during the year as compared with the previous year:—

Class of prisoners.	Remained on 1st January—				Received during the year including direct admissions and transfers.			
	1927.		1928.		1927.		1928.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Convicts ..	10,267	101	10,822	94	36,865	660	34,843	628
Under trials.	2,433	28	2,398	39	36,676	671	38,295	648
Civil ..	12	..	20	..	334	..	352	..
State ..	6	..	1	..	17		8	..
Total ..	12,718	129	13,241	133	73,889	1,331	73,498	1,276
Grand Total	12,847		13,374		75,220		74,774	

Class of prisoners.	Remained on 31st December—				Average daily strength of the year.			
	1927.		1928.		1927.		1928.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Convicts	10,822	94	10,952	105	10,771·32	103·95	11,021·42	105·62
Under-trials.	2,404	39	2,766	39	2,603·46	33·76	2,816.36	35·56
Civil ..	20	..	11	..	21·16	..	23·73	..
State ..	1	..	2	..	2·48	..	2·21	..
Total ..	13,247	133	13,733	144	13,398·42	137·71	13,863·72	141·18
Grand Total	13,380		135		13,536·13		14,004·90	

There has been a substantial increase in the daily average population during the year under report as compared with the previous year.

The number of convicts on the 1st January was 10,916, against 10,368 in 1927; 22,354 were imprisoned during the year 1928 against 23,970 in the previous year, and 531 were received by transfer from other provinces.

The average number of European prisoners was 32.97, against 30.03 during the previous year.

Religion.—Of the 22,354 convicts admitted during the year, 56.20 per cent. were Muhammadans, 39.95 per cent. Hindus, 0.89 per cent. Christians, 2.00 per cent. Buddhists and Jains; 0.96 per cent. belonging to all other classes.

Age.—The number of convicts of less than 16 years of age admitted was 75 (72 males and 3 females) or 0.34 per cent. of the total of all classes of convicts, against 335 or 1.40 per cent. in 1927. Of these 13 boys were received direct at the Juvenile Jail, while 30 were admitted from the various sub-jails and 32 from central and district jails.

It is satisfactory to note that there has been a considerable fall in the admission of juvenile prisoners during the year under report as compared with the figures of the preceding 3 years which stood at 335, 240 and 128 respectively. The operation of the Bengal Children Act is partly responsible for this decline. The committing courts are to be congratulated on this good result and it is hoped that there will be a rapid decline in the admission of juvenile prisoners to jails with the extension of the Bengal Children Act to all districts.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Diet in debility

IT has been demonstrated that many cases of illness which manifests itself mainly as debility, associated with headache, constipation, nervousness, and in severe cases recurrent (cyclical) vomiting, are due to Ketosis. This is a condition which is primarily due to disturbance of the function of the liver as a consequence of which digestion and assimilation of fat are markedly retarded or even for the time abolished. If, however, sugar is added to the diet the disease is rapidly cured.

It is evident that when fat is administered to children it should not be in a form that gives rise to derangement of the function of the liver and heart muscle, and that it should be guarded by an adequate quantity of sugar.

In the treatment of debility, apart from a sufficiency of protein, carbohydrates, and fats, a sufficiency of mineral salts, notably calcium and iron, and a well balanced vitamin content are of great importance.

These conditions are admirably fulfilled in Virol, which is composed of Marrow Fat, Glycerine Extract of Red Bone Marrow, Malt Extract, Eggs, Lemon Syrup, with Salts of Lime, Iron, etc., and which has been shown by independent investigations to contain all the vitamins.

The great value of Virol in debility and wasting conditions has been proved in a widespread clinical experience and by its continued use in more than 3,000 Hospitals and Clinics.

VIROL

Virol Ltd., Ealing, London, W.5, England.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

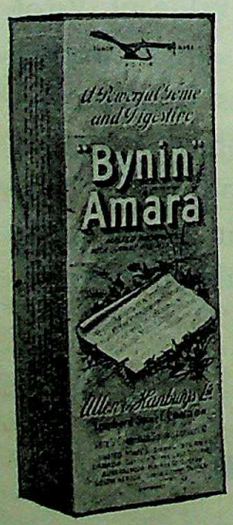
'BYNIN' AMARA

TRADE MARK

A Powerful Tonic and Hæmatinic

'BYNIN' AMARA is of special value in neurasthenia, particularly when associated with low blood pressure, anæmia and atonic dyspepsia; in convalescence it gives that impetus which often enables the system to overcome the aftermath of disease and to recover completely

'Bynin' Amara has important advantages over Easton's Syrup on account of its basis being 'Bynin' Liquid Malt in the place of syrup. The 'Bynin' Liquid Malt, besides having valuable digestive and nutritive qualities is an efficient solvent for the other ingredients and helps to mask their unpleasant taste.



COMPOSITION:

Quinine Phosphate	1½ gr.
Iron Phosphate	2 „
Nux Vomica Alkaloids equal to Strychnine	$\frac{1}{16}$ „
'Bynin' Liquid Malt	1 oz.

In bottles containing 10 oz., 20 oz. and 40 oz.

DOSE: 2 to 4 fluid drachms in water twice or thrice daily after meals.

Further particulars will be sent on request.

Allen & Hanburys
Ltd.,
LONDON

Special Representative for India:
A. H. P. JENNINGS,
Block E, Clive Buildings, Calcutta

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Education.—The number of convicts able to read and write was 9.78 per cent., able to read only 2.72 per cent., and illiterate 87.50 per cent.

Of the 22,354 convicts imprisoned during the year, 27.27 per cent. had sentences not exceeding one month, against 30.07 per cent. in the previous year, 25.70 per cent. over one month and not exceeding three months, 17.12 per cent. over three months and not exceeding six months, 16.01 per cent. over six months and not exceeding one year, and 13.38 per cent. over one year; 0.45 per cent. were sentenced to transportation for life and term and 0.07 per cent. were sentenced to death. Two thousand, four hundred and eighty-seven were sentenced to simple imprisonment, 19,850 to rigorous imprisonment, 14 to rigorous imprisonment with solitary confinement, and 3 to rigorous imprisonment with whipping.

The percentage of prisoners with sentences not exceeding one month shows a decrease as compared with the previous year, but it is still far too high.

State prisoners.—The number remaining at the beginning of the year was 1 and 8 were received during the year, either direct or by transfer from other jails, making a total of 9. Of these 7 were released or transferred, leaving a balance of 2 at the close of the year. There were no escapes or deaths among these prisoners. The daily average number for the year was 2.21. These prisoners are treated in accordance with the rules specially made by Government for their treatment.

Detenus.—This class of prisoners was detained under the provisions of the Bengal Criminal Law Amendment Act, 1925. Under the orders of Government they are excluded from jail statistics. There was no such prisoner at the end of the year confined in the jails of Bengal.

Subsidiary Jails.—The number of sub-jails in the Presidency was reduced from 63 to 62 during the year under report, due to the abolition of the Shazadpur sub-jail, with effect from 1st January, 1929.

Warder Guard.—The number of punishments inflicted on warders was 1,055 against 1,188 in the previous year. Of the punishments inflicted departmentally, the number of dismissals was 52, degradation or suspension 25, fines 469, extra drill 209, and censures or other punishments 300.

The number of punishments inflicted on warders during the part year shows an appreciable decrease as compared with the previous year.

The fall in the number of punishments may be due to the improvement of the morale of the warder force owing to improvement of their pay and prospects.

The long-standing grievance of the warder establishment has been removed by the grant of increased rates of pay on a liberal scale, with effect from 1st November, 1928, and this has been much appreciated by the warder guard in general. It is hoped that the revised pay will attract a better class of recruits for jail service.

The provision of an adequate number of family quarters for warders will make the service more attractive.

Escapes and recaptures.—During the year there were 11 escapes among convicts, 5 from inside and 6 from outside the jails; 4 of them were recaptured before the close of the year.

Out of the daily average population of 11,021.42 male and 105.62 female convicts, an average of 724.73 or 6.57 per cent. male and 4.19 or 3.96 per cent. female convict officers were employed during the year.

As in the previous year difficulty was experienced in finding suitable men for employment as convict officers. Most of the men promoted to convict officers' rank were not eligible under the rules and had to be promoted as special cases.

The number of convicts released under the remission rules was 5,637, against 5,703 in the previous year.

Forty-seven convicts were released during the year who came under the remission rules, but failed to gain any remission, against 27 in the previous year. The remission system worked well and is appreciated by prisoners. It is an incentive to convicts for doing good work and to be of good behaviour.

Claude Martin Fund.—A sum of Rs. 3,000 was received from the Commissioner of Police, Calcutta, out of the fund during the year under report for distribution among released prisoners.

The number of prisoners who received benefit from the fund was 2,121 against 2,444 in the previous year. The maximum amount received by a prisoner was Rs. 10, the same as in the previous year.

Financial.—The cost of guarding and maintaining prisoners in jails and subsidiary jails of this Presidency, including the cost of general supervision, amounted to Rs. 25,55,477 against Rs. 25,09,958 in 1927.

Presidency Jail.—The jail has a large workshop and some minor industries such as durrie and cloth-weaving, oil-pressing, printing of forms and coir-pounding. The jail also carries out the distribution of quinine treatments and cinchona products.

Alipore Central Jail.—The principal industries of the jail during the year were mustard oil-pressing, cane and bamboo works, and carpentry. The net profit during the year amounted to Rs. 6,920.

Midnapore Central Jail.—The principal industry of the jail during 1928 was tailoring of police uniforms. The minor industries included weaving of prison cloth, durries, ashnis, dosuti cloth, duster cloth, bandage cloth, garrah cloth, gamchas, towels, purdahs, etc., mostly required by the jail depôt; also cane work and mustard oil-pressing. A daily average of 405 prisoners were employed on manufactures. Police uniforms to the value of Rs. 1,19,824 were supplied during the year. Large orders for police uniforms were received from different districts in the Presidency and most of them were complied with during the year.

Rajshahi Central Jail.—The principal industry of the jail during 1928 was weaving of prison cloth and tailoring. The minor industries were mustard oil-pressing, durrie and ashni-weaving, cane and bamboo work, wheat-grinding, carpentry and smithy. The net profit during the year was Rs. 80,049.

Dacca Central Jail.—The principal industries of the jail during the year were blanket-weaving, tailoring of chaukidari, dafadari, excise and warders' uniforms, prison clothing and cloth-weaving (including durrie and carpet). The minor industries were mustard oil-pressing, cane and bamboo works, carpentry, wheat-grinding and smithy. The daily average number of convicts under sentence of labour was 1,220 and the number employed on manufactures was 702.

Sickness and mortality.—The following table shows the average number of prisoners, the ratio per mille of admissions to hospital, the daily average number of sick and the number of deaths among all classes during the past five years:—

Year.	Daily average number of prisoners of all classes.	Admissions into hospital.		Daily average number of sick of all classes.		Deaths from all causes of all classes of all prisoners.	
		Number of admissions.	Ratio per mille.	Daily average sick.	Ratio per mille.	Total number of deaths.	Ratio per mille.
1923...	13,734	15,751	1,146·8	577·31	42·0	207	15·0
1924...	13,477	14,993	1,112·5	521·43	38·6	226	16·7
1925..	12,653	12,091	955·5	430·77	34·0	165	13·0
1926..	12,772	11,737	918 9	402·17	31·4	175	13·7
1927..	13,536	12,952	56·8	439·73	32·4	197	14·5
1928..	14,005	12,332	880·5	416·04	29·7	190	13·5

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The following table shows the deaths and admissions from the chief diseases among convicts in 1928.

	1927		1928	
	Admissions.	Deaths.	Admissions.	Deaths.
(1) Cholera	1	1	1	...
(2) Dysentery	526	14	372	14
(3) Malarial fever ...	3,080	16	2,853	13
(4) Pulmonary tuberculosis and hæmoptysis due to tuberculosis ..	133	32	146	23
(5) Other general diseases	4	2	7	2
(6) Anæmia and debility ...	117	3	126	4
(7) Other general diseases ..	4,569	74	4,399	67
(8) Pneumonia ..	82	19	120	26
(9) Other respiratory diseases	278	2	282	8
(10) Diarrhœa ..	670	1	527	5
(11) Abscess, boils and ulcers of all kinds ...	621	2	598	3
(12) Out of hospitals ...	..	1	...	1
Total ...	10,081	167	9,431	166

Correspondence.

GONORRHŒA AND ITS TREATMENT WITH "ACRIFLAVIN."

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—The writer has for some time been seeking a cheap, yet efficacious, drug for the treatment of gonorrhœa. The patients who seek treatment for this disease are numerous and can ill afford treatment involving much expense. To meet the situation I have selected "Acriflavin" (Boots), Euflavin and Tryflavin. I have tried these preparations in a dozen of my patients; the results were roughly as under:—

All these preparations are administered intravenously under strict aseptic measures. A dose of gr. 1 dissolved in 5 c.c. of double distilled water is given as the initial dose; this is gradually increased up to 1.75 grains.

The maximum number of injections so given is 10 to 12, administered bi-weekly. Though it has been recommended by some that the total number of such injections be continued up to 15, it is my practice to abandon the treatment if the first four or five injections do not produce a response.

Eight persons, all males, having a gonorrhœal discharge were treated first. In 5 patients there was a decided improvement after 6 injections. In 3 patients improvement was noticed after 4 injections and continued up to 10 injections. In another 3 persons, with 6 to 7 injections, urethral discharge and other distressing symptoms totally subsided and they appeared to have been cured.

In some of the patients who resisted treatment as far as urethral discharge is concerned, the injections were supplemented by urethral injection or irrigation of "Acriflavin" 1 in 1,000. This brought about an apparent cure within a very short time. In the single case of a female having a copious discharge and burning pain, a marvellous result was provided after a course of four injections; both the discharge and the burning pain stopped.

In brief, the results obtained are undoubtedly encouraging.—Yours, etc.,

S. P., L.M.F. (Cal.),
Medical Officer,

PIPLI,
5th October, 1929.

NEW CONCEPTIONS OF SCIATIC PAIN AND ITS TREATMENT.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—The paper by Major Hance, I.M.S., and his collaborators on "New Conceptions of Sciatic Pain and its Treatment" is of considerable interest to radiologists, as such cases are frequently passed on to them for treatment.

The bulk of the material included dealing with the admirable work of Professor Putti on the subject is already known to many of us, and calls for no comment. It is fairly generally recognized that the majority of cases of so-called "idiopathic" neuritis are of arthritic origin, the causative factor usually being focal sepsis. In the case of a sciatic neuritis, the appearances described by Professor Putti of an arthritis of the lumbar intervertebral joints, with effusion of inflammatory exudates, destruction of cartilage, and, in some cases, ankylosis, causing pressure on the funiculus at the intervertebral foramen, are constantly observed by radiologists.

It is at Major Hance's statement to the effect that he has not been able to find any but the scantiest reference to electrical treatment for this condition, that I am amazed! If Major Hance will refer to Dr. E. P. Cumberbatch's *Essentials of Medical Electricity,* and to the same author's *Diathermy,* he will find details of the treatment given.

It has been my *routine* treatment both at the Medical College, Calcutta, and in private, for the last five years, to give diathermy to all acute cases of sciatica. At first I used to apply one electrode to the painful part, and another opposite, but since reading Professor Putti's paper, I have also heated up the lumbo-sacral region on the side involved.

In some cases I have used a single large electrode on the abdomen and overlapping the groin as one pole, and two smaller ones both connected to the opposite pole. One of these is placed on the lumbo-sacral region on the involved side, and the other on the painful sciatic nerve. The total area of these two electrodes is very much less than that of the large abdominal one.

As regards the galvanism given by Major Hance on alternate days with diathermy, I prefer to use this when the acute stage has passed. It may be given either in Schnée baths, or with pads soaked in saline. Major Hance has startled me by his statement that he uses the *negative* pole on the painful part. He will find his results will be very much improved if he uses the positive pole here, and the negative pole, in the form of an indifferent electrode, elsewhere, e.g., on the abdomen.

A routine investigation and treatment of such cases could be summarized as follows:—

1. *Investigation of cause.*—

(*a*) Examination generally.

(*b*) Examination of the spine and pelvis, the latter including a rectal examination.

(*c*) Radiography in both positions—(posterior and lateral) of the lumbo-sacral region.

Radiography of the pelvis; radiography of the teeth; radiography of the accessory nasal sinuses.

(*d*) Examination of the fauces.

(*e*) Examination of the stools, especially if there is any history of bowel irregularity.

(*f*) Examination of the urine.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

028469

All the vitamins are present in

Glaxo

which can be prescribed with every confidence as the sole food for an infant from birth

"Extensive researches on the vitamin content of Glaxo show that Glaxo contains as high a content of vitamins A and B as fresh milk of good quality and almost as high a content of vitamin C."

BRITISH MEDICAL JOURNAL, *Jan 23rd. 1926.*

Information and Literature gladly sent on request to :

H. J. FOSTER & CO., LTD., P. O Box 202, BOMBAY.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Lacquin

REGD.

"THE TONE FOOD OF THE TROPICS"

(Pure Milk and Quinine in Powder form blended with Coffee)

THIS is the new "Cow & Gate" Product—introduced with confidence to the Medical Profession in India as a valuable tonic nutrient in tropical fevers and in the debility and enervation consequent upon residence in hot climates.

In **"Lacquin"** Quinine Sulph. B.P., has been combined with a pure milk base and blended with fine coffee. By the simple addition of hot water a most agreeable beverage of the coffee type is prepared, the bitter and objectionable taste of the Quinine being effectually masked.

Each breakfast cupful of **"LACQUIN"** contains 2½ grains of Quinine and 2 cups per day will therefore give the regulation dose of 5 grains.

"LACQUIN" is more than a mere vehicle for the pleasant administration of Quinine. The exceptional tonic and nutritive properties of pure English milk are conveyed to the system and enable it to resist Malarial and epidemic infection.

Distributed in India by

SMITH STANISTREET & CO., LTD., CALCUTTA.

Who will willingly send samples and literature on request.

Guildford **England.**

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(*g*) In doubtful cases a Wassermann reaction should be done.

2. *Treatment.*—

(*a*) *General.* Where possible the cause should be eliminated., e.g., by the removal of septic teeth or tonsils. Vaccines in the case of bowel infections, etc. Rest in bed is essential while the pain is at all severe, and all exercise should be, as far as possible, cut out while there is any pain at all.

(*b*) *Drugs.* Aspirin and Veramon are of value. In very severe cases morphia may be needed to control the pain.

(*c*) *Electrical.* Diathermy should be given every day as described. The treatment should last twenty minutes, excluding two minutes or so to get up to maximum; in diathermy there is no need to spend five minutes in doing this, and there even less need in spending five minutes in coming down to zero. It is in galvanism that this need arises. The amount of current shown on the milliampéremeter will vary with the size of the electrodes used; it may be anything between 500 and 3,000 milliampéres, or more. The main thing is to heat to the maximum of the patient's tolerance, and to heat evenly.

When the acuteness of the attack has passed off, galvanic current is used, either in Schnée baths, or with pads soaked in 1 per cent. saline. The positive pole should be used on the painful part, and the current raised to maximum and lowered very slowly, taking five minutes each way. The total duration of the treatment should not exceed half an hour. In some cases salicylate ionization is of value, and in such cases the negative is the active pole.

Ultra-violet irradiation, both general and local, taken together with galvanism and diathermy, has a markedly beneficial effect, and shortens the time of convalescence.

When the pain subsides, exercise should be taken very gradually. The galvanism should be kept up three times, and later twice weekly, till the patient is quite well.

I am glad to say that I have not yet had a case that has failed to respond to treatment on the lines indicated.—Yours, etc.,

G. GALSTAUN, M.A., D.M.R.E., M.R.C.S., L.R.C.P.,
Hon. Radiologist, Medical College Hospitals.

CALCUTTA,
12*th October*, 1929.

ALUMINIUM UTENSILS AND TUBERCULOSIS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—There is a common belief in the rural area among laymen that the use of aluminium utensils gives rise to tuberculosis. I have not seen any literature, or any article in your esteemed journal regarding the use of such utensils—therefore will you or any of your learned readers throw light on this subject.—Yours, etc.,

IKRAWD DUIABBASI (IKRAM-UD-DIN).
Medical Officer,
In-charge Dispensary,

MAHATPUR,
DIST. JULLUNDUR,
PUNJAB,
8*th October*, 1929.

(*Note.*—We know of no ground for such a belief, except that possibly aluminium utensils are not scoured as bright as brass ones and might therefore harbour tubercle bacilli. This would of course only apply to utensils that are used for eating out of—not to those that are used for cooking.—EDITOR, *I. M. G.*)

A CASE FOR DIAGNOSIS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the case which appeared in the September issue of your paper for diagnosis, I suggest that the case is one of arterio-venous aneurysm between the internal carotid artery, and the internal jugular vein of the right side, just below the superior bulb of the vein. The loud bruit is conducted through the mastoid (or petrous) part of the temporal bone to the internal ear to be heard as the "chirping of the birds." The same bruit is heard by the patient's guardians when they apply their ear and also by the doctor through his stethoscope. The sound is conducted to the occiput and the temporal region of the other side through the lateral sinuses. As regards the cause of this aneurysm, only this much can be suggested, that (in the absence of any history of trauma or of any previous aneurysm of the internal carotid artery) there may have been some inflammation about the region of the superior bulb of the vein leading to the formation of adhesion between the artery and the vein. I think other signs and symptoms are only superimposed.—Yours, etc.,

UMA PADA MUKHERJEE,
Carmichael Medical College, Calcutta.

1, BELGACHIA,
24*th October*, 1929.

BOGUS "M.Ds."

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—Cannot anything be done to check one of the gravest abuses in the lay press of to-day? I refer to articles—advertisements would be better term—published in lay newspapers over the bogus signature "M.D." I have seen a considerable number of cases where laymen have read such articles, recommending some non-ethical line of treatment, and have transferred their treatment from that given by registered medical practitioners to bogus "M.Ds." The results are frequently disastrous.

A personal friend of mine had a son who developed tuberculous arthritis of the knee joint. He read such an article in the lay press advocating some special "nature cure." He finally came to me with the patient in a hopeless condition, which ended in a fatal issue. I could quote further examples.

It is the title "M.D." in such articles that misleads the public. Cannot the Medical Councils of India do something to check this evil?—Yours, etc.,

C. H. KARNIK, L.C.P.S.

CIVIL HOSPITAL,
SAWANTWADI, *via* BELGAUM,
BOMBAY PRESIDENCY,
10*th October*, 1929.

(*Note.*—Our correspondent raises what is undoubtedly a serious issue. As long as the Indian public remains as uneducated in medical matters as is now the case, so long will it remain credulous; the same indeed may be said even of the educated public of Great Britain.

The Medical Councils are in a difficult position. They can only take action upon specific information lodged and definite evidence produced. Such proceedings would probably lead to litigation; whilst the vague use of the 'qualification' "M.D.," without any indication of the university at which the advertiser obtained this diploma. whilst a legal offence, presumably, would be one which it would be difficult to run to earth. The best solution of all, of course, would be to so educate the general public that they would realize that the vague term "M.D.," without any indication of the university from which the degree was granted means nothing. A second solution would be action by Government; but the evils of quackery in India are so widespread that very extensive legislation would be called for to check them effectively—something on the lines prevalent in the United States, where, if fraudulent medical advertisements are being sent through the post, they are opened, marked "Fraudulent," and returned to the sender.

A third solution would be for the lay newspapers concerned to look up the official medical directories concerned, and ascertain whether the "M.D." is or is not an M.D. of a recognized university and belongs to a registered medical practitioner, before publishing the letters or articles concerned. We are afraid however that journalism would hesitate before adopting such an altruistic attitude.—EDITOR, *I. M. G.*)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THE STERILIZATION OF HYPODERMIC SYRINGES.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the correspondence in your columns with regard to the sterilization of hypodermic syringes, we beg to state that in our experience 90 per cent. Spiritus Rectificatus is the best, most rapid, and easiest method for sterilizing all types of syringes. We have given some few thousands of subcutaneous, intramuscular, and even intravenous injections with syringes sterilized in this manner, and have never seen abscess formation or any other trouble follow. The method is as follows:—

Spiritus Rectificatus, 90 per cent., is carried in a small stoppered phial. After fitting the needle to the syringe a sufficient quantity of spirit is drawn into the syringe, and then ejected back into the phial. This is repeated five or six times. Finally, the whole needle and the adjoining part of the barrel of the syringe is dipped into the spirit, and the piston once. The spirit is then allowed to dry before the syringe is filled with the solution to be injected. After the injection the syringe is cleaned with water, and its parts replaced in its case.

We have frequently used the same syringe to give a series of injections to a number of patients, one after another, at the same time, using only this simple mode of sterilization, without seeing any subsequent harmful results.—Yours, etc.,

K. P. SARKAR,
P. B. SIRCAR,
Medical Officers.

MESSRS. BIRD & CO.,
BARA JAMDA P. O.,
SINGHBHUM DISTRICT,
B. N. RY.,
3rd September, 1929.

THE TREATMENT OF VAGINISMUS.

To the Editor, THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the recent correspondence in your columns on this subject, it should be pointed out that complete investigation of the conditions underlying it is only possible when the patient is fully anæsthetised. Under such conditions local lesions are not infrequently discovered, the most common being red spots and patches at the urethral meatus and in the vulva just outside the hymen or its remains. Sometimes one or more of the carunculæ myrtiformes show similar red patches, with increased vascularity and round celled infiltration of the corium. In other cases small fissures or excoriations may be present at the entrance to the vagina. Occasionally, a more remote cause may be present, such as vaginitis, a prolapsed ovary, or a fissure of the anus.

Opinions differ widely as to the essential cause of the spasm. Its treatment calls for much patience and tact. The best method is probably forcible digital dilatation of the vulva under an anæsthetic, followed by the daily passage of vaginal dilators. A 10 per cent. solution of cocaine is first applied to the vulva, and a 1|4" bougie is passed, fixed in position with a T bandage, and retained for two hours. By the fourth or fifth day a 5|16th" bougie can be passed, and by gradual steps a 1" bougie can be used daily for two or three days. The series can then be repeated without the use of a local anæsthetic. If there is any slight spasm or discomfort, a weak solution of glycerine and carbolic acid may be applied.

The essential point in treatment is not to cause the slightest pain during the insertion of bougies, to gain the patient's confidence, and not to hasten matters. From eight to twelve weeks may be needed. When a 1" bougie can be passed without any local anæsthetic, or glycerine-carbolic acid, the condition is usually completely cured.—Yours, etc.,

SHAILENDRA MUKHERJI,
Medical Practitioner.

BOALIA, KALUPOT P. O.,
NADIA DISTRICT,
15th August, 1929.

Service Notes.

APPOINTMENTS AND TRANSFERS.

LIEUTENANT-COLONEL H. W. ILLIUS, F.R.C.S.E., C.I.E., I.M.S., Officiating Inspector-General of Civil Hospitals, United Provinces, to be President of the United Provinces Medical Council, *vice* Colonel C. A. Sprawson, M.D., F.R.C.P., C.I.E., I.M.S., resigned from 16th July, 1929.

Lieutenant-Colonel J. R. J. Tyrrell, I.M.S., an Agency Surgeon, on return from leave, is posted as Chief Medical Officer in Central India and Residency Surgeon, Indore, with effect from the 22nd September, 1929.

Lieutenant-Colonel R. F. D. MacGregor, M.C., I.M.S., an Agency Surgeon, on return from leave, is posted as Residency Surgeon and Chief Medical Officer, Baluchistan, *vice* Lieutenant-Colonel J. Husband, I.M.S., reverted from the cadre of Agency Surgeons under the Government of India in the Foreign and Political Department, with effect from the 16th September, 1929.

Lieutenant-Colonel W. J. Simpson, I.M.S., an Agency Surgeon, is posted as Agency Surgeon in Bhopal, with effect from the 22nd September, 1929.

On return from leave, the services of Lieutenant-Colonel H. G. Stiles-Webb, I.M.S., are replaced at the disposal of the Army Department.

Lieutenant-Colonel H. R. Nutt, I.M.S., Civil Surgeon, on return from leave, to Allahabad.

Lieutenant-Colonel J. F. Boyd, I.M.S., Civil Surgeon, on return from leave, to Aligarh.

Major H. Williamson, O.B.E., I.M.S., is appointed to officiate as an Agency Surgeon and is posted as Civil Surgeon, Sibi, with effect from the 28th August, 1929.

Major E. S. Goss, M.C., I.M.S., Officer-in-charge, Medical Store Depôt, Lahore, is appointed to officiate as Assistant Director-General, Indian Medical Service (Stores), *vice* Lieutenant-Colonel Lapsley, with effect from the date on which he assumes charge of his duties. He will be appointed permanently to that post with effect from the 3rd November, 1929.

Major R. L. Vance, I.M.S., an Officiating Agency Surgeon, resumed charge of his appointment as Civil Surgeon, Quetta, with effect from the 15th September, 1929.

Captain H. W. Mulligan, I.M.S., a temporary officer of the Medical Research Department, is posted as supernumerary officer at the Central Research Institute, Kasauli, with effect from the 9th September, 1929, or subsequent date on which he assumes charge of the duties of the appointment.

Major G. Covell, I.M.S., an Officer of the Medical Research Department, is placed on foreign service under the Indian Research Fund Association for employment as Assistant Director, Malaria Survey of India, with effect from the 9th September, 1929, or subsequent date on which he assumes charge of the duties of the appointment.

The services of Major M. A. Singh, I.M.S., are placed at the disposal of the Government of Bengal for employment in the Bengal Jail Department, with effect from the 6th August, 1929.

PROMOTIONS.

Brevet-Colonel to be Colonel.

W. H. Leonard, F.R.C.S., K.H.P., I.M.S., dated 10th June, 1929, *vice* Colonel A. Spitteler, O.B.E., M.B., I.M.S., retired.

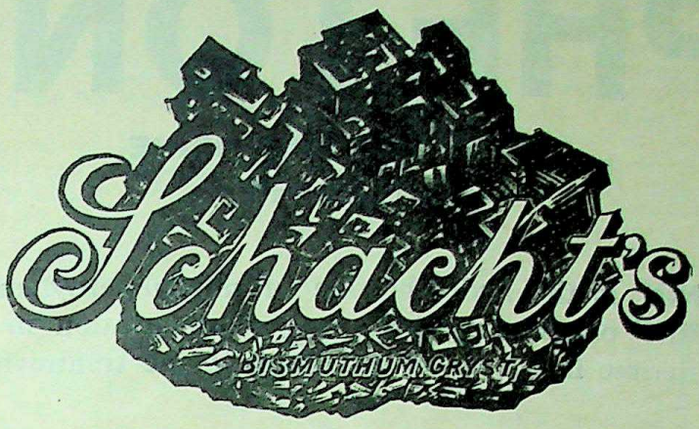
The promotion to his present rank of Major A. N. Palit, F.R.C.S.E., I.M.S., as published in Army Department Notification No. 225, dated the 10th February, 1922, is antedated from "29th January, 1922" to "29th July, 1921."

The promotion to his present rank of Major Monindranath Das, M.C., M.B., I.M.S., as notified in Army Department Notification No. 236, dated the 5th March, 1926, is antedated from "31st January, 1926" to "31st July, 1925."

The promotion to his present rank of Major J. H. Smith, M.B., I.M.S., as published in Army Department Notification No. 1065, dated the 20th August, 1926, is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri



Original Preparations

FOR THE USE OF

THE MEDICAL PROFESSION

LIQ. BISMUTHI "SCHACHT."

Absolutely pure and perfectly stable. The original preparation and the most physiologically active solution of Bismuth. Dose: One drachm, diluted.

PEPSINA LIQUIDA "SCHACHT."

A palatable, standardised solution of gastric juice from the pig. Useful in the treatment of dyspepsia. In ten-minim doses it gives excellent results in infantile diarrhœa. Adult dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO "SCHACHT."

Each fluid drachm contains in a concentrated form, besides the Pepsina Liquida, one fluid drachm of Liquor Bismuthi "Schacht." Dose: One drachm, diluted.

PEPSINA LIQUIDA C. BISMUTHO CO. "SCHACHT."

Contains one grain of Soluble Euonymin in each fluid drachm, in addition to the Pepsine and Bismuth. Dose: One drachm diluted.

BISEDIA.

A combination of Schacht's Liquor Bismuthi and Pepsina Liquida, with Morphia and Hydrocyanic Acid. Of the greatest value in the treatment of Acute Dyspepsia, Gastric Ulceration, Vomiting of Pregnancy, etc. Dose: Half to one drachm, diluted.

LIQ. CASCARÆ DULCIS "SCHACHT."

A palatable and very concentrated aromatic preparation of the finest Cascara Sagrada; free from bitterness and griping action. Dose: Quarter to one drachm.

LENIVA.

An excellent fruit laxative syrup, containing Alexandrian Senna, Figs, Prunes, Tamarinds, etc. Eminently suitable for delicate women and children. Dose: Half to two drachms according to age.

Distributors for India:

B. K. PAUL & CO.,
Bonfield's Lane, CALCUTTA.

GILES, SCHACHT & CO.,
BRISTOL, ENGLAND.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

TRADE MARK

'EPHETONIN'

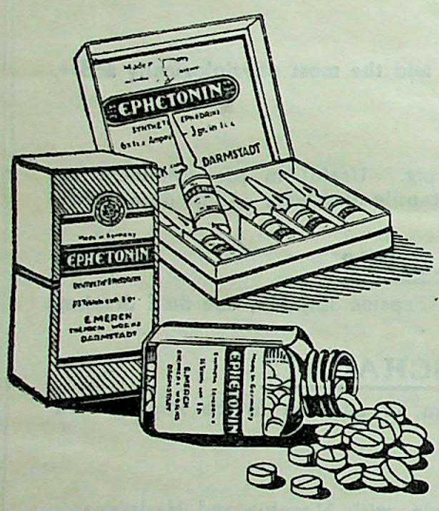
BRAND

SYNTHETIC EPHEDRINE

$C_{10}H_{15}NOHCl$.

'EPHETONIN' is the hydrochloride of phenylmethylaminopropanol. **'EPHETONIN'** offers convenient oral administration in place of hypodermic injections of adrenalin in the treatment of

Bronchial Asthma
Respiratory Paralysis
Hay Fever
Hypotonia etc.



The action of "Ephetonin" is analogous to that of Adrenalin, but it is superior to this by reason of its more prolonged effect, its low toxicity, its effective absorption from the intestinal tract, the absence of habit formation and its stability in solution.

It is distinguished by

Therapeutic Potency **Low Toxicity**
Oral Administration **Constant Effect**

Unlike Adrenalin, it may be given not only subcutaneously but by the mouth. Solutions may be sterilised by heating.

DOSAGE: Commence with half a tablet, or $^1/_4$ gr. powder, twice or thrice daily, increasing the dose as required up to a maximum of a whole tablet, or $^1/_2$ gr. powder, three times a day.

PACKING: Bottles containing 25 tablets ($^1/_2$ gr.)
Bottles containing $^1/_2$ oz. powder
Boxes containing 6 × $^1/_2$ gr. 1 c.c. ampoules.

E. MERCK CHEMICAL WORKS **DARMSTADT** (GERMANY)

Represented by Messrs. MARTIN & HARRIS Ltd., CALCUTTA, BOMBAY, MADRAS.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

antedated from the 1st August, 1926 to the 1st February, 1926.

The promotion to his present rank of Major A. C. Craighead, M.B., I.M.S., as published in Army Department Notification No. 1194, dated the 1st September, 1928, is antedated from the 9th August, 1928 to the 9th February, 1928.

The promotion to his present rank of Major J. Findlay, I.M.S., as published in Army Department Notification No. 1085, dated the 7th August, 1925, is antedated from the 26th July, 1925 to the 26th January, 1925.

Captain to be Major.

Ajab Singh Garewal. Dated 1st October, 1929.

Lieutenants to be Captains.

P. H. Cummins. Dated 26th August, 1929.
J. J. Beausang. Dated 26th August, 1929.
T. C. Ramchandani, M.B., F.R.C.S.E. Dated 12th May, 1929.

LEAVE.

Lieutenant-Colonel J. B. Lapsley, M.C., I.M.S., Assistant Director-General, Indian Medical Service (Stores), is granted leave on average pay for 3 months under Fundamental Rules, combined with leave for 9 months under Military Furlough Rules, with effect from the 1st October, 1929, or date of relief.

Lieutenant-Colonel N. M. Wilson, O.B.E., I.M.S., Civil Surgeon, Simla West, is granted leave on average pay for 3 months and 22 days, with effect from the 7th November, 1929, and his services are replaced at the disposal of the Government of the Punjab from the 1st March, 1930.

Lieutenant-Colonel W. D. Wright, I.M.S., Civil Surgeon, Allahabad, leave for 2 years and 2 months, preparatory to retirement, with effect from the 18th October, 1929, or date of availing.

Lieutenant-Colonel B. E. M. Newland, I.M.S., Civil Surgeon (on leave), leave for 1 month in extension of the leave already sanctioned.

Major F. R. Thornton, I.M.S., Civil Surgeon, Coorg, is granted leave on average pay for 20 days, with effect from the 4th December, 1929.

RETIREMENTS.

The undermentioned officers are permitted to retire from the service, subject to His Majesty's approval:—

Major-General Sir Walter H. Ogilvie, K.B.E., C.B., C.M.G., M.B., K.H.P., I.M.S., dated 2nd September, 1929.

Lieutenant-Colonel H. M. H. Melhuish, D.S.O., I.M.S., with effect from the 3rd September, 1929.

Lieutenant-Colonel John Norman Walker. Dated 29th August, 1929.

MISCELLANEOUS.

The following extract from the *London Gazette*, dated the 6th September, 1929, is published for general information.

India Office,
6th September, 1929.

GEORGE R. I.

WHEREAS we deem it expedient to consolidate and amend the rules for the promotion and precedence of Our Indian Medical Service contained in Our Warrant of 28th May, 1913, and in such other Warrants granted since that date as are still in force.

Our Will and Pleasure is that from and after this date the following rules shall be established:

It is also Our Will and Pleasure that this Our Warrant shall be administered and interpreted by Our Secretary of State for India in Council, who shall be the sole and standing authority upon the matters herein contained.

1. The substantive ranks of Medical Officers in Our Indian Military Forces shall be as follows:—

Major-General.
Colonel.
Lieutenant-Colonel.
Major.
Captain.
Lieutenant.

The Director-General of Our Indian Medical Service shall hold the substantive rank of Major-General, or, when approved by Our Secretary of State for India in Council, the substantive rank of Lieutenant-General.

2. An Officer will not be permitted to remain in the Service if at any time during the first three years from the date of his first commission his retention therein is, in the opinion of Our Secretary of State for India in Council, undesirable.

3. Except as otherwise herein provided, a Lieutenant shall be eligible for promotion to the rank of Captain on completing three years' full pay service, if he has previously passed such examinations as may be prescribed by Our Secretary of State for India in Council, and is in all other respects qualified and recommended. An Officer who has not passed the prescribed examinations may be provisionally promoted, if, in the opinion of Our Governor-General of India in Council, he has not had a reasonable opportunity of passing. Such provisional promotion may be cancelled as soon as he has had such opportunity and has not passed.

4. Except as otherwise herein provided, a Captain shall be eligible, if in all respects qualified and recommended, for promotion to the rank of Major on completing nine years' full pay service in the rank of Captain. This period may be reduced by six months in the case of an officer who produces satisfactory evidence of progress in any branch of knowledge which is likely to increase his efficiency. A Captain who may be prevented by exigencies of the Service from obtaining an opportunity of qualifying for such accelerated promotion shall have the concession open to him for a period of four years after his promotion to the rank of Major in ordinary course, but any antedate of promotion which may be granted shall be without adjustment of pay.

5. Except as otherwise herein provided, a Major shall be eligible, if in all respects qualified and recommended, for promotion to the rank of Lieutenant-Colonel on completing eight years' full pay service in the rank of Major, including any period covered by antedated promotion without adjustment of pay.

6. Time on half-pay, not exceeding one year, shall be allowed to reckon as service for promotion under Articles 3, 4 and 5 if removal to half-pay has been in consequence of medical unfitness caused by duty, military or civil. An officer shall not by reason of any promotion during the late war be eligible for promotion to the rank of Major/Lieutenant-Colonel under 12/20 years' service from the date of first commission (or 11½/19½ years from the date of first commission if he is entitled to the reduction of six months specified in Article 4), except that an officer appointed as the result of the competitive examination of July 1915 may be promoted to the rank of Major/Lieutenant-Colonel at such date before he has completed 12/20 years' service as may be required to avoid his supersession (otherwise than through the reduction of six months in the circumstances specified in Article 4) by an officer entering the service by nomination during the war.

7. A Captain after at least six years' service, a Major or Lieutenant-Colonel may be promoted to the next higher rank by brevet for distinguished service in the field or for meritorious or distinguished service of an exceptional nature other than in the field.

8. A certain number of Lieutenant-Colonels may be specially selected for increased pay for ability and merit.

9. Promotion from the rank of Lieutenant-Colonel to that of Colonel and promotion to the rank of Major-General, shall be given by selection for ability and merit, and the grounds of such selection shall be stated to Us in writing, and recorded in the Office of Our Secretary of State for India.

10. A Lieutenant-Colonel may also be promoted to the rank of Colonel, and a Colonel to the rank of Major-General, for distinguished service in the field. In any such case the Officer shall remain supernumerary in the higher rank until the vacancy to which, in the ordinary course, he would have been promoted, or, in the case of an officer promoted to the rank of Colonel, until selection for the rank of Major-General.

11. Exchange between officers of Our Indian Medical Service and officers of Our Royal Army Medical Corps.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

being of the same rank and below the rank of Major, and transfers of officers below the rank of Major from either of the abovementioned Service to the other, shall be permitted with the approval of Our Army Council and of Our Secretary of State for India in Council, and on the following conditions:—

(1) That the officers have less than seven years' service.

(2) That in the case of Captains, their seniority for the purpose of exchange shall be determined as if they had been promoted after the period of service required for promotion to that rank in the Service into which they exchange, but that any alteration of date of rank made in pursuance of this provision shall be without adjustment of pay.

(3) Subject to (2) that the senior officer exchanging takes the place of the junior on the list to which he exchanges, and shall not be promoted until the officer next above him has been promoted, or has been refused promotion in consequence of failure to qualify for it.

(4) Subject to (2) that the junior officer exchanging is placed for seniority next below all officers on the list to which he exchanges whose commissions have the same date as his own.

(5) That the officer transferred is placed for seniority below all officers holding the same rank at the time of his transfer, and shall not be promoted until the officer next above him has been promoted or has been refused promotion in consequence of failure to qualify for it.

12. With a view to maintaining the efficiency of the Service, Medical Officers shall be placed on the Retired List when they attain the following ages:—

Director-General, 60.
Director of Medical Services in India if an Officer of Our Indian Medical Service, 60.
Major-General, 60.
Colonel, 57.
Brevet-Colonel, 57.
Lieutenant-Colonel, 55.
Major, 55.

But a Lieutenant-Colonel who entered the Service before the 1st April, 1911, and who has been specially selected for increased pay under Article 8 may, if he attains the age of 55 years before he completes 27 years' service for pension be retained until completion of such service.

13. An officer appointed after the 11th September, 1890, who may retire on pension before completing 30 years' service, shall be liable, till he completes 55 years of age, to be recalled to duty in case of emergency.

14. Six of the most meritorious officers of Our Indian Medical Service on the Active List shall be named Our Honorary Physicians and six Our Honorary Surgeons, and they shall relinquish such appointment on retirement. On appointment as one of Our Honorary Physicians or Honorary Surgeons an officer under the rank of Colonel in Our Indian Medical Service may be promoted to the brevet rank of Colonel.

Given at Our Court at *St. James'* this 7th day of August, 1929, in the Twentieth Year of Our Reign.

By His Majesty's Command,
WEDGWOOD BENN.

NOTES.

INGRAM'S RUBBER PRODUCTS.

RUBBER GOODS are especially liable to deteriorate in the climate of India, and it is therefore essential that supplies of such materials should be purchased from unimpeachable sources. One of the best known and reliable British firms in this connection is J. G. Ingram & Son, Ltd., the London India Rubber Works, Hackney Wick, London, E. 9, established in 1847. We have recently received from them a series of small brochures which they publish, and which will be of interest to our readers. One deals with the "Agrippa" teat for feeding bottles; this has a reinforced band of rubber at its base which effectually prevents the teat from slipping off the bottle; it is also claimed that it will withstand sterilizing by boiling indefinitely. The "Eclipse" hot water bottle is designed on a new principle, so as to make leakage from the neck impossible. Special lines of air cushions and seamless household red rubber gloves are also described in the same booklet.

A second booklet gives an illustrated list of the products manufactured by the firm, including seamless enema syringes; ear, nose and urethral syringes, etc. The firm also issues from time to time a small journal entitled *Rubber Notes*, which contains much interesting information.

The Indian agents are Messrs. N. Powell & Co., Lamington Road, Bombay.

HEWLETT'S SODIO-CALCII LACTAS TABLETS.

THE firm of Messrs. C. J. Hewlett & Son have so world-wide and established a reputation that any new preparation placed upon the market by them is of interest. One of their recent and most interesting preparations is a tablet containing 7½ grains of sodium-calcium lactate, flavoured and sweetened, so as to be readily taken by children and invalids. This preparation should be of special value for weakly children and as an aid to infants during dentition. For infants the tablets may be crushed and administered in milk.

A modification of this tablet is Hewlett's Tablet Sodio-Calcii Lactas cum Parathyroid. Each tablet contains 2½ grains of sodium-calcium lactate with 1/20th grain of parathyroid. These tablets have been found of value in the treatment of hæmorrhage in pulmonary tuberculosis, in surgical tuberculosis, and in backward, weakly and ricketly children. Although the manufacturers do not mention the point, it is also obvious that such a prescription is eminently suitable for the calcium-parathyroid treatment which is so often extremely successful in the treatment of sprue. The preparation is one which will certainly be of interest to our readers.

Publishers' Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 reprints *gratis*, if asked for at the time of submitting their manuscripts.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o The Calcutta School of Tropical Medicine, Central Avenue, Calcutta.

Communications for the Publishers, relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., P. O. Box No. 54, Calcutta.

Annual Subscription to "The Indian Medical Gazette," Rs. 16 including postage, in India, Rs. 18 including postage, abroad.

Papers and articles forwarded for publication are understood to be offered to *The Indian Medical Gazette* alone, and any breach of this rule will be followed by non-publication. When any such article appears in the *Indian Medical Gazette*, the copyright automatically becomes the joint property of the author or authors, and of the publishers.

The Editors of *The Indian Medical Gazette* cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Antikamnia Tablets

Strongly Recommended in

INFLUENZA and LA GRIPPE

For the headache, pain and general soreness give a five-grain Antikamnia Tablet crushed with a little water; if the pain is very severe, two tablets should be given. Repeat every 2 or 3 hours as required. One single ten-grain dose is often followed by complete relief.

NEURALGIA

In the treatment of Neuralgia and Myalgic Pains, Antikamnia Tablets are not only palliative, but, along with other measures, assist in ultimate cures; they also have a field of use in Rheumatic and Gouty Affections. In Neurasthenia, Hysteria and Migraine they are a valuable adjuvant to the other recognised therapeutic measures.

LARYNGEAL COUGH

Frequently remains after an attack of La Grippe, and has been found stubborn to yield to treatment. There is an irritation of the larynx, huskiness, and a dry and wheezing cough, usually worse at night. The prolonged and intense paroxysms of coughing are controlled by **ANTIKAMNIA AND CODEINE TABLETS,** and with the cessation of the coughing, the laryngeal irritation subsides.

Antikamnia Tablets are the least depressing of all the drugs that can exercise so extensive a control of pain, and also least disturbing to the digestive and other organic functions.

Analgesic. Antipyretic. Anodyne.

Antikamnia Preparations in 1-oz. packages.

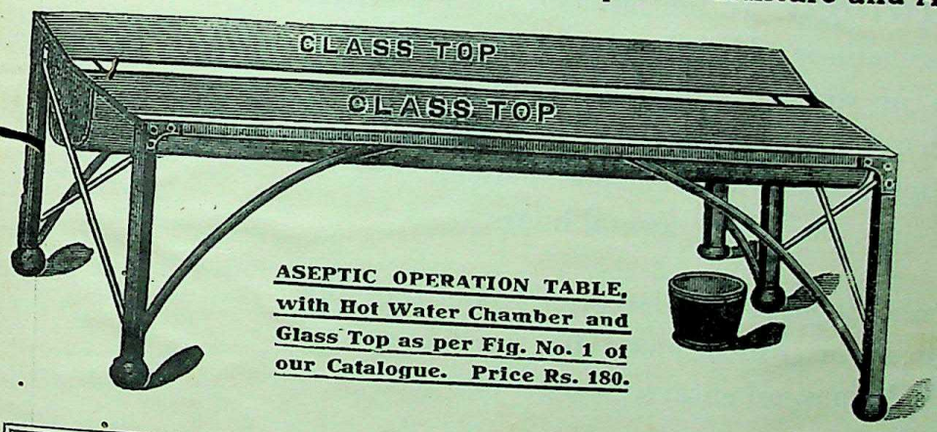
A SAMPLE of generous size will be sent all medical men sending their professional card. Also interesting literature.

FASSETT & JOHNSON Ltd.

86, Clerkenwell Road, London, E.C.1.

INCELL & SILK, LTD.

Manufacturers of Hospital Furniture and Appliances.



ASEPTIC OPERATION TABLE, with Hot Water Chamber and Glass Top as per Fig. No. 1 of our Catalogue. Price Rs. 180.

Catalogue with Prices and Particulars on Application

Hot Water Installations in Hospitals and Sanitariums a Speciality.

HEAD OFFICE and WORKS:—

10, Convent Rd., Entally, CALCUTTA.

Telegraphic Address; "ADVANCE."
'Phone No. 581.

Subscription in India and abroad, Rs. 16 per annum. Post free. Payable in advance.

THE INDIAN

JOURNAL OF MEDICAL RESEARCH

EDITED BY

THE DIRECTOR-GENERAL, INDIAN MEDICAL SERVICE, THE PUBLIC HEALTH COMMISSIONER WITH THE GOVT. OF INDIA

AND

THE DIRECTOR, CENTRAL RESEARCH INSTITUTE

IN COLLABORATION WITH

leading authorities on Tropical Medicine.

The Indian Journal of Medical Research is published quarterly. Each number contains about 200 pages and is Illustrated with Plates in Colour and Half-tone and with Diagrams and Charts, and is the only medium publishing the results of the best medical research work being carried on by leading scientific medical men in India and the East.

THACKER, SPINK & CO., P. O. Box 54, **CALCUTTA.**

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ADREPHINE

for Ventilation *of the* Air Passages

To relieve nasal congestion
In coryza
To promote sinus drainage
To prepare field for operation
To aid nasal ventilation

Fast The busy physician with many waiting patients and hospital appointments crowding, appreciates the fast, sturdy action of Adrenalin.

Certain The certainty of the action of Adrenalin, plus Ephedrine, in an *aqueous* solution is known. Adrephine contains no oily vehicle to slow and insulate the desired action.

Sustained To the fast, but fleeting action of Adrenalin is added the slower, long-sustained action of the true alkaloid, Ephedrine, from the stems of the Chinese plant, *Ma Huang*. This means comfort for the patient over a period of several hours.

Prescribe it with a Glaseptic Nebulizer—the nebulizer in which may be used aqueous solutions, oil sprays, or even powder.

Write it: "Adrephine, P. D. & Co., 1-oz., with Glaseptic Nebulizer."

ADREPHINE IS SUPPLIED IN OUNCE BOTTLES

PARKE, DAVIS & COMPANY

P. O. Box 88, BOMBAY.

PRINTED AND PUBLISHED BY THACKER'S PRESS AND DIRECTORIES, LTD., 6, MANGOE LANE, CALCUTTA.
Managing Agents:—THACKER, SPINK & CO., 3, ESPLANADE, CALCUTTA. *London*:—W. THACKER & CO., 2, CREED LANE, E.C.
London Advertising Agents:—W. THACKER & CO.
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Compiled
1999-2000

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar